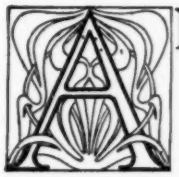

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Vol. 3—No. 5

THE PAPER INDUSTRY

A. SCOTT DOWD
Editor

A MONTHLY EDUCATIONAL JOURNAL
Devoted to the Interests of the Pulp and Paper Industry

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EDITORIAL

Ever Dream Something's After You—and You Couldn't Move a Step?

MAYBE when you were a youngster you had that dream—that you were being chased by somebody or something—and you couldn't move a step! Your feet were like lead, you were rooted to the spot and there seemed no chance to get out of the way of what threatened you. On and on came the menace, nearer and nearer until at last—you woke up or some disturbed member of the family roused you.

That's the way it seems sometimes in the paper business. It appears that some handicap is chasing you and you don't seem to be able to lift your business feet fast enough to get out of its way. Sometimes the nightmare is a production problem, a question of sales or one of the many other hobgoblins that pop up in the paper industry.

Then along comes a copy of The Paper Industry and wakes you up. Right in that issue you read how some other fellow has had the same experience as you—and has solved the problem. He tells how he reached the solution and you see right away that the same principles can be applied in your own concern.

Or perhaps in the advertising pages of The Paper Industry you read a to-the-point message that a certain piece of equipment is doing the very thing you want done—handling work more economically or turning out a superior product. And when you can do either of those things you can tackle the question of sales with more assurance. In either case everything is soon all right again—the threatened danger does not overtake you.

Of course you solve some of your problems—but not all of them. So does the other fellow in the paper industry but he does not solve all of his. No one man can think of everything and so the profitable solutions must be exchanged. But few business men have the time to travel from plant to plant until they find the one that has solved their particular problems. Therefore The Paper Industry's editorial department is organized as an efficient clearing-house of the newest, best and most profitable methods in the industry.

But the advertisers in The Paper Industry help in this, too. They must sell equipment that does better work and pays the plant a profit, if they themselves are to profit. Therefore the supplies they offer are those that experience has proved profitable to paper mills.

Thus the regular coming of The Paper Industry frequently serves to halt the chase of some of the hobgoblins of the business.

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Cutting Production Costs

THE big problem in every paper mill today (as well as other mills) is cutting production costs. If, in your manufacturing department, you can eliminate moisture with the consequent rotting roofs, steam and vapors from condensing and dropping back on paper rolls and unsatisfactory conditions generally, you are going to do it, aren't you? Sirocco heating and ventilating equipment in the paper mill means the elimination of a big slice of production costs.

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TRADE MARK

Such equipment is a long step toward a better product and more satisfied workmen.

If you are further interested our book, "A B C Equipment for Paper Mills," will be sent you.

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Deferred Demand Must Soon be Exhibited

IN answer to our own query on the subject of when we might expect a resumption of business to at least a degree of what we should enjoy at a time like this, when demand is so great and ability to fill it so ready at hand, and in an attempt to offer some explanation to our many friends who besiege us with the same question, we make the following statement:

Current consumption of paper as well as almost every other commodity is below normal—BUT

Current production of all commodities is below current consumption!

This situation has obtained for sometime past.

The excess of consumption over present production has been filled out of stocks on hand held by consumer and wholesaler.

Consumers' stocks of paper are well cleaned up; jobbers' stocks are likewise reduced to small volume.

Everybody has been keeping out of the market; only those orders have been placed which were urgently needed.

Just as all purchasers have remained out of the market together, so they will all re-enter the market and move on to the mills at the same time.

The question is WHEN?

We believe there will be some snappy buying in the early fall.

We are prompted to call these facts to your attention because of a statement contained in the July Survey of Business Conditions in the United States, issued by the National City Bank of New York, which reads as follows:

"There seems little reason for doubting the assertion that production is not only far below normal consumption, but is likewise considerably below current consumption. Stocks that have been accumulated are being eaten into, and there is doubtlessly a heavy demand that is being deferred until, in the current phrase, 'business picks up again.' A part of the deferred demand will have to exhibit itself positively in the near future regardless of the general condition of business; purchase on a scale comparable with the present low ratio of consumption cannot be indefinitely sustained."

107 millions of people in this country, the best educated, most civilized, richest, best dressed, shod, fed; possessing the highest standard of living in the world, constitute a market which Mr. George M. Reynolds says consume 93% of our productions.

Stocks of fabricated merchandise are vanishing; present production of same has not increased sufficiently to supply the present rate of consumption.

Large orders must be placed with mills and factories soon. They cannot be deferred much longer.

Are you and your customers making any provision to supply this coming demand?

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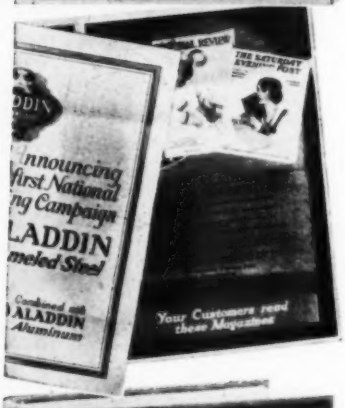
The publisher will find our manufacturing service covers every grade of magazine book, from the cheapest to the best, any finish, any quality, any tonnage. Books, magazines, publications, each have a mission which is enhanced or retarded by the paper used.



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Business Prospects

By R. L. S.

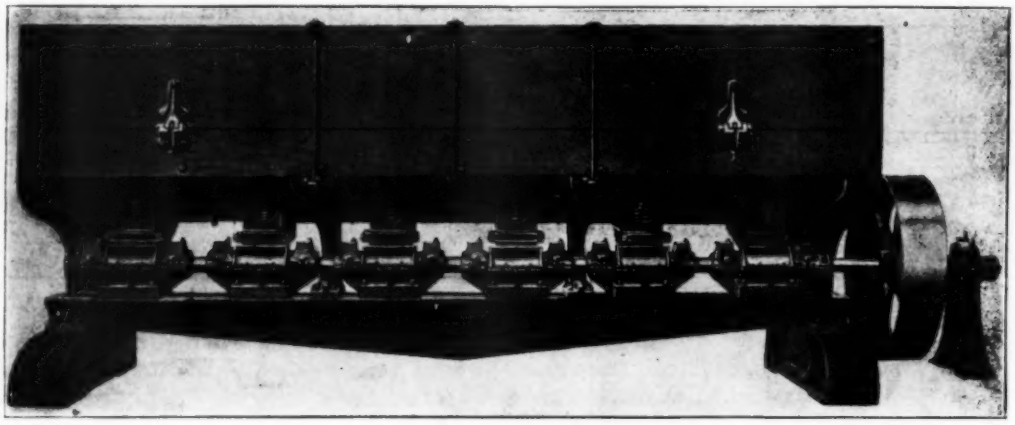
THERE undoubtedly never has been a time in the history of the country when business stagnation paralyzed commercial initiative to just the same extent that it is doing today. All agree that there is no reasonable excuse, yet everyone falls into line pinching and limiting outputs till it would seem that inertia is about to assume national attention.

This country is fairly staggering under a load of needed activities. That, in the face of this, idleness should be the rule, and limitation common, is the heighth of absurdity. How foolish when you stop to think of it—a country spending millions upon the destructive purposes that accompany war, yet sinking into inertia immediately following, when a child can see the need of recuperative action.

There are tens of thousands of miles of railroads in this country that a reasonable expenditure could electrify. There are hundreds of thousands unused horse power in hydro-electric energy. There are millions of pounds of coal wasted hourly by idle engines because power is not bulked in centralized units where coal could be husbanded and power distributed in a rational and economical manner.

A nation that can gather its mind to a destructive purpose must in time learn that this same United States of thought is required for constructive purposes and that it is just as legitimate to marshal 5000 engineers and 5,000,000 workers to do a constructive deed for the whole people as it is to gather this same number for the good of the outside world. A man is no less a worthy warrior because he puts a spade in the place of his bayonet. Some one must always get busy THINKING before that thinking can eventuate in actual accomplishment. Let the unselfish business man of the United States speak his mind.

Pulp and Paper Mill Machinery



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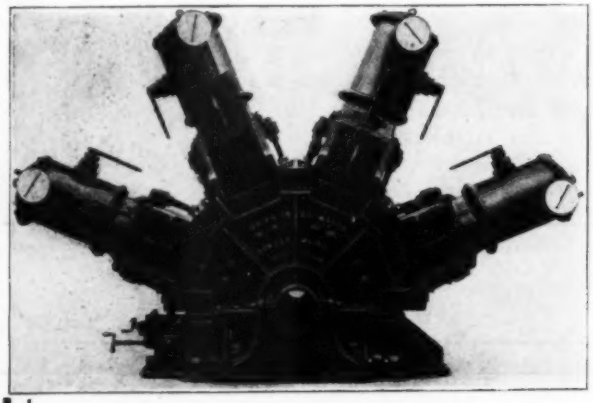

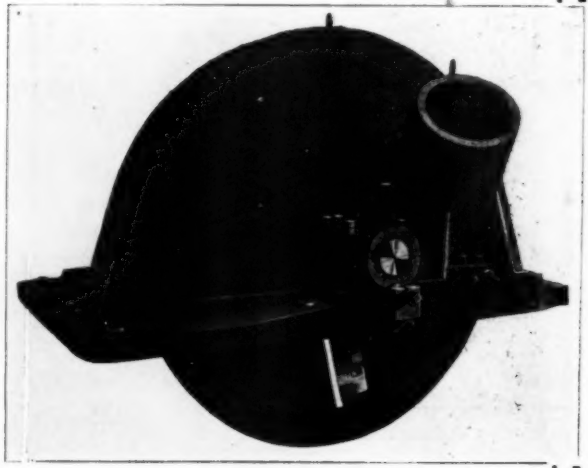

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Received Between October 1, 1920, and September 30, 1921

THE PAPER INDUSTRY was started with the one idea of being helpful to the whole Pulp and Paper Manufacturing Industry. We believe we have succeeded. At least many people tell us so, but we want to do more in being helpful, so that every man in the industry may know more of his chosen work.

Many men in this industry have valuable ideas that would be worth hundreds, possibly thousands of dollars, for other men to know, and at the same time will not harm the one man that knows it. The old idea of hiding our light under a bushel for fear someone else will learn of something that we may know has passed, and the war was to a large degree responsible for this. It is stated that America advanced more in most of the arts and sciences, as well as manufacturing processes, in the few years of the war period, than it had in fifty years before.

We lose nothing by giving out knowledge. If each of two men have a dollar and each gives his to the other, both will have the same and gain nothing, but if each of two men have an idea, and each gives away that which he has, he does not lose, but each has two, and so if we multiply this by one hundred or a thousand, each man that formerly had only one idea, now has a hundred or thousand, and no one has lost.

So, in order that the greatest number may have the greatest amount of knowledge, and in order to get men to take the time for the proper study and preparation of the right kind of an article, we will give to those who will endeavor to furnish us with real helpful articles, during the next twelve months, the following amounts:

For the best article furnished in this competition, we will give the sum of $300.00.
For the second best article we will pay $100.00.
For the third best article we will pay $50.00.
For the fourth best article we will pay $25.00.
For the fifth best article we will pay $15.00.
For the next thirty-one best articles, we will pay $10.00.
For the next forty best articles we will pay $5.00.

Any one man may write as many articles as he desires, providing they are on different subjects. Each article, however, should fill at least three pages of THE PAPER INDUSTRY.

Several well known men of the industry will be chosen as judges in this competition, their names to be announced at a later date, and the publisher of THE PAPER INDUSTRY will only decide first whether the article is worthy of publishing at all, and if so, then it will take its chance for the $300.00 prize.

In order to make it possible to publish these papers during the next twelve months, papers must begin to come in immediately and the minimum price of $5.00 will be paid for each as they are published, the balance representing the prize money will be awarded after the twelve months period has expired, and the decisions have been made.

Some men feel that they know many good things, but cannot write them down in proper fashion. It will not be necessary that these articles be written to show any great amount of learning, as many men who have had little schooling may be able to furnish the most helpful ideas, and it is something that is helpful that we want; we have an editor for the very purpose of carefully scrutinizing everything before it goes to the printer, so that it may be grammatically and typographically correct.

You can choose your own subject, as there are so many things to be written about in this great industry that we will not even attempt to outline the full list of subjects, but it may be of some plan to get a larger product out of a machine; it may be on the subject of saving in the power plant; saving bleach, dye, or one of many other things; it may be a plan to make the wire or felt last longer; some method of making a better sheet without increasing the cost, or making as good a sheet by reducing the cost; a new idea in the process of pulp making; in fact it can be on any subject that will be helpful to pulp and paper manufacturers, and their employes.

Anyone can try his hand, be he president, manager, superintendent, chemist, engineer, machinery man, foreman, or workman. If some one should feel they cannot write a long article, then write a short one. We will pay for it, if we can use it.

Start NOW and get your article or articles in at the earliest possible time.

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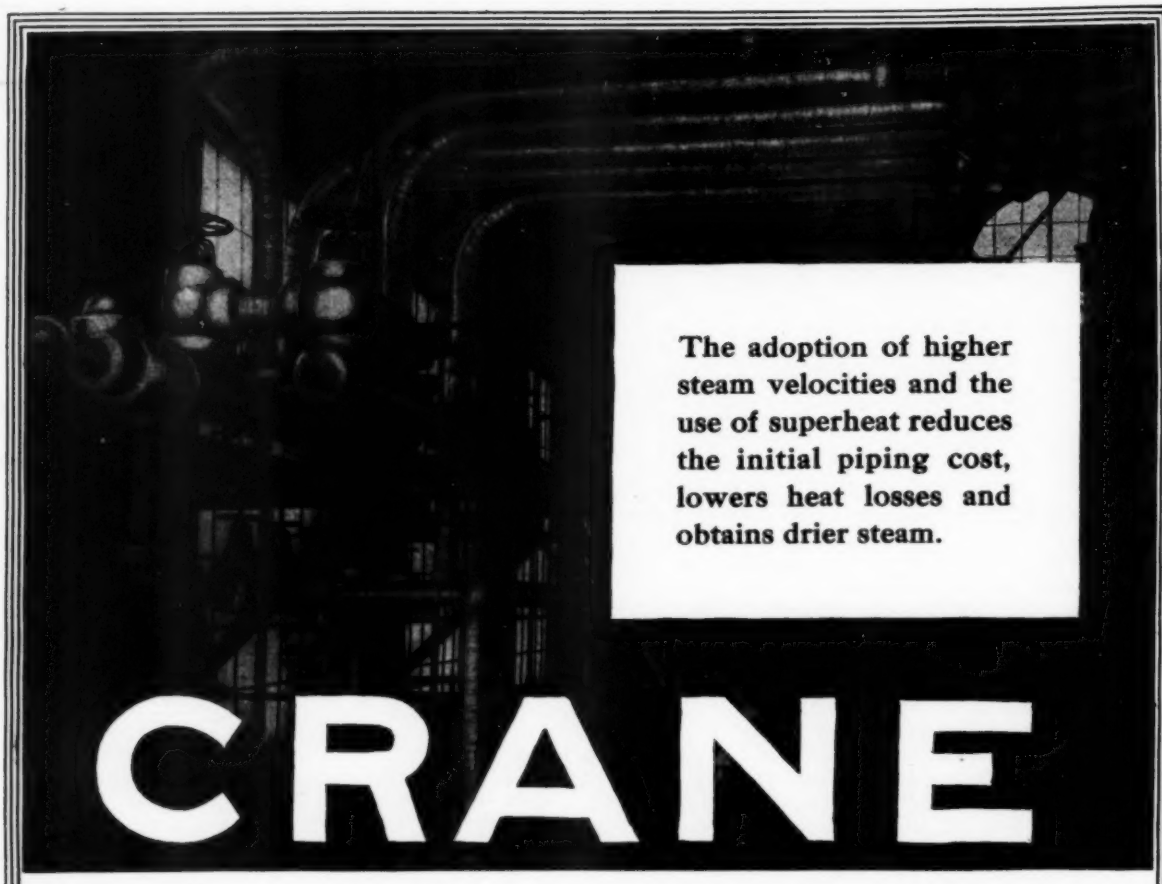

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Governmental Encouragement of Paper Standardization

By WALDON FAWCETT

IF Uncle Sam be not wholly responsible for the present movement looking to the complete standardization of commercial papers, certainly must it be conceded that the national government has offered influential encouragement. As a large buyer of diverse grades of paper stock, and a buyer in a position to indulge in a certain amount of independence of spirit, the government has been enabled to bring pressure to bear in numerous quarters for the standardization of paper sizes and qualities. Moreover, the big institution at Washington has been enabled to point out more authoritatively than any private propogandist in the trade, the advantages of paper standardization.

Governmental instigation and furtherance of paper standardization has taken two different forms: the academic and the practical, these might be termed, for the sake of contrast. On the one hand, we have the technical research and scientific investigation in behalf of paper standardization which has been carried on persistently for, lo these many years, at various Federal institutions, notably the U. S. Bureau of Standards. On the other hand, we have the urge to standardization constantly exerted upon the paper industry by the paper purchasing agencies of the government.

The latter influence is due for especial attention just now, not because it is necessarily the most portent but because certain interesting new factors are about to be injected. For one thing, plans are hatching for a concentration of governmental printing which is bound to make for standardization of governmental paper specifications. In addition to the government Printing Office at Washington, the largest printing establishment in the world, the government has been operating between two hundred and three hundred field service printing and binding plants. These isolated print shops have been scattered in all parts of the country, but that there has been duplication of facilities may be imagined from the fact that there have been in operation in New York City and vicinity something like a dozen plants. It has been decided that the time has come for a scaling down. Nothing will be done precipitately, no mergers or discontinuances ordered until the situation has been carefully canvassed and a snuggling up process devised that will work no hardship, but ultimately there will be sweeping consolidations of the field plants.

Standardizing Government Printing

Matching the concentration of governmental printing plants as an influence for paper standardization is another Federal administrative innovation that is in prospect. This second factor of the hour is the impending standardization of government printing. Here again we have an undertaking that will not be carried out tomorrow or the day after. But Congres is at work on a bill to amend, revise and codify the laws relating to the public printing and binding—the first move in this direction since the year 1895. In the train of this overhauling of the statutes will come the standardization of printed forms throughout the government service. It is obvious that standardization of printing will necessitate standardization of paper to the last degree.

In reality, the paper purchasing agencies of the government, notably the Joint Committee on Printing of the Congress of the United States, have been working steadily, for more than a dozen years past in the direction of paper standardization. Long before the National Bureau of Standards started its missionary work in behalf of paper standardization and long before the General Supply Committee, under the jurisdiction of the U. S. Treasury, sought to strike a balance in paper specification, a constructive force within the Congressional committees on printing was working quietly but steadily for the objective of paper uniformity. The paper industry will hear much, in the months to come of the influence which Uncle Sam's newly-created Bureau of Budget will exert in behalf of paper standardization but, as a matter of fact, the Budget organization will take its cue from the Congressional agency.

Because the Joint Committee on Printing, for all that it remains in the background, is the power behind the throne in the purchase of paper by the government, it is worth while to examine the workings of this body in furtherance of paper standardization. As our readers probably know, the Joint Committee is made up of four Senators and two Representatives, the present Chairman being Senator George H. Moses of New Hampshire. But for all that a majority of the members, notably Senator Arthur Capper of Kansas and Representative Albert Johnson of Washington, have, in their private capacities as publishers, had more or less experience in the purchase of paper, the committee does not attempt to carry out the practical obligations attendant upon paper specification, testing, etc.

Paper Specifications and Tests

Paper standardization and all kindred matters are delegated to a Committee on Paper Specifications

which, once each year revises the standards and specifications under which are made purchases of paper for the public printing and binding for a period of six or twelve months. This standardization committee, as it might be termed, is composed of six members as follows: the chemist in charge of the paper laboratory as the U. S. Bureau of Chemistry, Department of Agriculture; the specialist in charge of the paper laboratory, Bureau of Standards, Department of Commerce; the purchasing agent of the Government Printing Office; the Assistant Storekeeper of the Government Printing Office; the Clerk (secretary) to the Joint Committee on Printing and an Inspector of paper on the staff of the Joint Committee on Printing.

While the government has experimental paper making plants qualified to produce test samples of paper, there is no restriction to this source for standard samples. Latitude is allowed by the regulations covering "standard samples" which stipulate that the Public Printer shall select from paper received during the contract period or ordered especially for the purpose, previous to the solicitation of bids, sample papers, which, when approved by the Joint Committee on Printing, shall become the standard samples for the next contract period. These standard samples must be obtained from a single lot in quantity sufficient to furnish sample sheets to bidders and to contractors during the contract period.

Balancing the standardization of specification samples is the standardization of the tests to which delivery samples are subjected. Representative sample sheets are selected from each delivery and are subjected to uniform appraisal of the qualities that are capable of accurate measurement. The standardization program provides that tests for strength, weight and thickness shall be made by the testing laboratory at a relative air humidity of 65 per cent and temperature of 70 degrees F., and sample sheets, properly separated must be subjected to these standard conditions previous to the tests a sufficient time to come to equilibrium with the surrounding atmosphere.

Work of the National Bureau of Standards

With attention turned to the standardization of paper samples and paper testing procedure, it is observed how very close does the academic equation of paper research in behalf of standardization approach to the practical influence of standardization of Federal paper purchases. Had the National Bureau of Standards not been called upon to serve as a testing station for the governmental paper purchasing organization, it is doubtful if this clearing house of technical knowledge would have gone as for as it has in constructive inspirational work in behalf of the paper industry as a whole. Testing and research have proceeded together. It is a long step in advance, that scientific tests, rather than inspectors' judgment, now determine paper quality, but it is even more gratifying that the experts, in drawing the indictments to eliminate undesirable papers, have discovered the very qualifications most essential to standardization of paper quality.

It was at the initial conference, some eight years ago, between paper manufacturers, the executives of commercial testing laboratories and the experts of the Bureau of Standards that it was first suggested, on behalf of a number of paper companies, that the bureau at Washington should take up the standardization of paper and paper testing not only as applied to government purchases but also as applied to the entire paper industry. There has since grown steadily in governmental circles an appreciation of the importance and benefit of such standardization both to paper manufacturers and consumers of paper.

With its methods of routine testing standardized and with the samples submitted for test, running, in some instances, above 5,000 a year from governmental sources, in addition to hundreds from private interests, it is inevitable that the Standards Bureau should acquire, in the course of its "checking up" operations valuable insight into the essentials of paper standardization. Indeed it is not unusual for the preparation of a standard specification to require the development of special tests designed to meet special factors by which the quality of given materials may be definitely recorded. The work at the Standards Bureau in behalf of a tearing test translatable into numerical values and the quest for means to express the sizing quality of paper in numerical terms well illustrate the inspirations that have come with the effort to lead the industry in the direction of more uniform product.

In framing rules of thumb for the purchase and verification of the government's purchases, aggregating 50,000 tons per year, the Bureau of Standards has reached the conclusion that standardized tests should be three-fold; namely, physical, chemical, and microscopical. The chemical tests determine the amount of resin sizing in the paper and the amount of filler and loading that has been added to give the paper bulk, opacity, finish or surface. The physical tests result in the determination of weight, thickness, bursting strength, folding endurance and tensile strength. Study under the microscope of selective strains enables an estimate of the properties of the fibrous material from which the paper is made.

Not the least of the influences which the government has engendered in behalf of the cause of paper standardization is found in the assistance supplied by the Bureau of Standards to members of the paper industry. From the time the Standards Bureau took up its quest, a steady procession of visitors representative of the trade has journeyed to the paper laboratory on Pierce Mill Road, District of Columbia, to observe the methods employed to derive a foundation for standard specifications and standardized products. Out of that contact there has grown, on the

part of many of the paper makers an ambition to follow in the footsteps of the governmental institution in installation of testing and experimental equipment. To such aspirants every possible assistance has been given, since Uncle Sam is keen for anything that will promote standardization. With the Standards institution faring so far afield in its missionary work as to write the specifications for a paper mill for the Siamese government and outline the plans and equipment for a paper-testing laboratory for the Australian government it would be odd indeed if it did not exert itself in the role of counsellor to the American paper industry.

The record of the government in its attempt to place on a scientific basis the specification and purchase of paper ought to refute the suspicion that exists in certain quarters to the effect that standardization operates not only to discourage individuality in production and deny to sellers effective "talking points" but actually encourages consumption of lawer rather than higher grades of paper. It is quite true that standardization has in some instances enabled the government to substitute lower priced paper for the higher grades, but there have also been instances where the sequel has been a shift from a lower to a higher grade. For example, it is thanks to standardization and its attendant blessings that the charts of the U. S. Coast and Geodetic Survey are not printed on more suitable stock than was formerly employed.

Should React to Benefit of Paper Industry

It is the claim of the government experts that the attainment of paper standardization, and an educational campaign calculated to familiarize small users with the standards and thereby enable them to more correctly judge papers for particular uses, is bound to react to the benefit of the paper industry. It should induce, first of all, a large proportion of satisfied customers,—proverbially the best of advertisements. More than that, it should make a better market for certain classes or grades of paper, to produce which there has heretofore been little encouragement because public demand has been so scattered over a wide range of special requirements. Best of all, it tends to reduce the number of demands from paper consumers for special papers of sundry kinds, the purposes of which would be as well or better served in most instances by a standard grade.

All unsuspected by many members of the industry is the blessing that U. S. governmental standardization of papers is likely to prove to paper manufacturers who export their product. For some time past American paper makers who sell overseas have, every now and then, found difficulty in squaring with the exactions of foreign customs laws and regulations. For instance, several American manufacturers of vegetable parchment paper, used for wrapping meats, fish, butter, cheese, etc. had no end of difficulty with the Australian and New Zealand customs authorities in securing a correct classification for American parchment papers. In that instance, the paper specialists of the U. S. government were enabled to secure relief for the paper interests but only after a prolonged correspondence whereby they finally convinced the Australian authorities that their method of testing did not enable anyone unfamiliar with the subject to make a correct decision as to whether specified paper was or was not a true vegetable parchment paper. It will be infinitely more beneficial than even such intercession in individual cases if American paper standards can be developed that are so obviously equitable and technically sound that foreign customs authorities will be moved to accept them. Especially is this the case now that so many nations are, alike to the United States, engaged in a general revision of tariff laws.

Current Specification Standards

While Uncle Sam has no desire to force his ideas of paper standards upon the industry except in so far as the paper purchases for government account are concerned, it is worth while to study the schedule which the Committee on Paper Specifications has recently prepared and which will remain in force until 1922. Printing papers are by this standardization subdivided into white newsprint, colored newsprint, machine-finish printing, plant-fiber machine-finish printing, antique printing, opaque printing, high-machine finish, rag machine finish printing, sized and supercalendered printing and halftone printing. "Coated Book" carries the classifications double-coated one side book, single coated and double coated both side book. "Writings" have standardized groupings of white French folio, white and colored high-machine finish, white and colored writing tub-sized, air or loft-dried, fine white writing, tub-sized and loft-dried, and safety writing machine finish. The "Bonds" show thin bond, white and colored, glazed and unglazed, tub-sized, machine or air dried. The same range is shown in stationery bond and in fine white bond. In the "Ledgers" the classification steps include white commercial ledger and colored commercial ledger, each tub-sized, air or loft-dried, white and colored ledgers, respectively, carrying the stipulation tub-sized and loft-dried, and heavy ledger, white and colored single ply. "Covers" entail smooth covers, rough covers, coated covers and cloth-lined cover.

In the government's standard specifications the form of expression is one indicative of a minimum or limitation rather than a precise stipulation. Thus we see the demand that the thickness shall not be less than a specified fraction of an inch; that strength shall not be less than so many points; that ash shall not exceed an indicated percentage; that the stock shall have a certain proportion of rag, and so on. The specifications are not intended as formulae for the

manufacture of the several kinds of paper but as descriptions of the lowest grades that will be accepted. The governmental paper standards incorporate some features that might not be universally accepted in commercial practice. For example, the standard of plant-fiber, machine-finish printing paper (of which the government proposes to purchase 1,000,000 pounds during the next six months) was established to encourage the commerical production of paper made from domestic corn and cotten stalks, flax and cereal straws, wild and cultivated grasses and other plants not now used in making paper.

Inasmuch as the Paper Committee of the National Association of Purchasing Agents has lately issued recommendations for standard packing papers, both in rolls and sheets, it may be worthy of passing comment that the government is essaying standardization in this same quarter. Dry lumber not less than 7/8 inch thick is specified for packing cases. Flat paper is required to be put up flat, approximately 600 pounds to the case of even reams. Coated paper must, according to the standard program, be packed with heavy binder's boards, top and bottom of the case. Uncle Sam does not countenance a variation above the ordered ream weight of more than 5 per cent. It is the government practice to have the Public Printer not only supply all cores (3 to 6 inches diameter) for roll paper but to supply the labels for all cases and rolls. In conclusion, it may be noted, as a source of satisfaction to the paper industry, that if the time is coming when all purchases will be made on "standards" and when, perhaps, the government will attest to private buyers "certified standards of quality," there will be reward for the foresight which has prompted the paper industry to meet the issue of standardization squarely and in good season.

Proper Use and Care of Paper Cutter Knives

By W. F. EBBING

THE subject "Proper use and care of paper cutting knives and correctly manufacturing them" is an important one and yet very little understood or appreciated.

In days gone by, one item, that of tempering was done by color of the fire or of the steel as it was being heated. Occasionally you hear the statement "We don't get as good knives as we used to." Imagine for a moment several men making a certain grade or kind of paper and testing it by hand exclusively and all agreeing it was of a certain test without the use of the various testing instruments, or in making paper, throw an armful of pulp, and an armful of something else into a beater and say, "That will make this or that grade of paper," and expect to get the same thing today that you got yesterday.

Paper cutting knives are a very fine finished product made under exacting conditions. The control of heats whether that of forging, hardening or tempering is essential. The best instruments to regulate and control the various heats are used and records kept.

The manufacture of machine knives begins properly with the manufacture of raw materials. Laboratory samples taken at random from shipments are analyzed and tested for ingredient contents, hardness and surface defects such as seams and decarbonization, and internal defects.

The methods of machine knife manufacture vary according to the sizes and materials. Welded knives such as paper cutting knives, the making of suitable forgings is the first process, these are then trimmed and sheared to approximate finish size, then rough ground, hardened, tempered, rough beveled, surface ground to uniform thickness, finish, grinding, drilling and beveling sharp. At each intervening step the knives are straightened and inspected for defects during manufacture.

Prior to packing for shipping, a final inspection and scleroscope test is made before the O. K. stamp is applied. This stamp signifies the guarantee behind which the manufacturers stand.

The care and grinding or resharpening of paper cutting knives is an important item, and too much stress cannot be laid upon its importance.

Conditions vary so, in different sections, and in cutting different stock, that it is impossible to give any set rules for the care of paper knives. As soon as a knife is put in operation it begins to wear, and this sooner or later results in a dull edge, and the knife has to be sharpened—the cutting edge put in proper condition for its work. This can be done by honing, but it is only a question of time before the knife has to be ground. Under these conditions, I think you will agree with me that the most important items in the care of a paper knife are grinding and honing. The men doing this work should know the construction of a knife, and as the grinding is done with a manufactured wheel, should know the principles governing the action of it, and should realize the important part the paper knife plays in the operation of a plant.

The cutting edge of the paper knife is a high grade of high carbon steel, welded to a backing of a lower

grade of steel. Knives vary in thickness from ½" to ¾". The high carbon steel is ¼" to ⅜" thick; the bevel is from 1" to 1¾" making the cutting edge of the knife very thin, which it must be to do the work required. After the knife is hardened and drawn to the proper temper for its work, the High Carbon Steel is very much harder than the backing, which being so low in carbon, will not take much if any temper. In grinding, stock has to be removed from two grades of steel; in addition to this, the point of contact is broad, and the grinding done on thin stock on the high carbon side of the knife, the edge being so thin, it is very easily injured.

Must Keep Heat Low

If a place in the knife, or the whole knife is heated hot enough to draw the temper, that knife afterwards is no earthly use for cutting paper. If the knife is blued or checked in grinding, the steel is ruined, and before the knife is any good again the steel has to be removed below the injured part.

Water is, or should be used in the grinding process, not as a means of quenching heat but, rather, to prevent its creation and radiation. It is a necessary means of keeping the work at an equable temperature, to obviate heatings as well as distortion. The supply should be plentiful and steady, better if applied at the grinding point, and with sufficient force to keep the wheel face clean. It also washes away the particles which wear off the wheel. This helps to prevent glazing. Clear water is better than water that has been used over and over, as the dirt in the water that has been used has a tendency to fill up the face of the wheel causing it to glaze.

A grinding wheel must be kept running true. A wheel running out of true delivers a blow at each revolution, and as there would be several hundred such blows delivered per minute this would cause undue heating and drawing of the temper in the knife.

A free and cool cutting wheel, fed to the work at the proper pressure, will not leave a wire edge but will leave a feather edge. A wire edge requires more honing.

To remove the false edge quickly, draw a piece of end wood across the edge of the knife, which removes particles of steel clinging to the edge. Then hone to a perfectly true smooth edge. Should there be a rough place in the edge of the knife, although not noticeable to the naked eye, particles of fibers of the wood are liable to get in or catch on this rough place, causing it to break out.

Edge Must Be Smooth

These spots or places can be detected by drawing the thumb nail across the knife. The edge must be absolutely smooth to give perfect cutting.

Proper honing is as necessary as proper grinding. In honing, the hone should rest on the whole length of the bevel and the full length of the hone on the face side of the knife, thus keeping the edge true with the bevel. If the knife is honed a number of times between grindings, this cannot be followed, as you are obliged to hone on the extreme edge and, consequently, will have a rounded edge. I know some good operators will, in honing a freshly ground knife, round the edge slightly. I cannot understand why this is done unless the operator thinks it the quickest way to get rid of the wire edge.

I believe it is more economical to grind often and keep the cutting edge straight, than it is to hone or whet the edge as much as would be necessary with less frequent grindings, as one is very liable to whet low places in the edge.

The importance of the work which the paper knife has to do warrants the best grinding equipment and this, to get the best results, must be kept in perfect repair. If the bearings become worn, allowing play, it is liable to produce end motion to the wheel spindle, which will make high and low places in the edge of the knife. This condition will also occur if the ways of the carriage are worn and do not travel through without lost motion, which means poor grindings, often costly grinding and loss of knife stock.

Some suitable place should be prepared for the knives after they are put in operation when not in use. They can be bolted on boards, which will protect the edge, and then placed on racks. It is so easy to nick the edge of a knife, although it is only 1/32" or 1/64". It is just that much loss of cutting stock, besides the time putting the knife in shape again.

The manufacturers of paper knives are human, and unfortunately, will make mistakes. Consequently, some knives that are not up to par will get out, which is regretted by manufacturers more than by the parties receiving the knife. Should you receive a knife that is not suitable for your work, do with it as I advise your doing with an unsatisfactory wheel—return it, and it will gladly be made right.

If you receive a letter from the firm manufacturing your knives asking how a certain knife shipped on a certain day is working out, and if you can see that it is better than other knives furnished by them, it means that they are trying to give you a better knife, either by using a better steel or in treating it differently, and are asking for your opinion as much for your benefit as for their own. The manufacturers of this class of knife are honestly trying to give a better knife. If you receive such a letter it is as much for your benefit as theirs to give them your candid opinion.

Upon taking charge of a new plant, do not begin by making promiscuous adjustments. It is better to wait a day or two until the apparatus is thoroughly understood, and then changes should be made only after the object to be attained is definitely known.

A dangerous man is one who acts with no thought of consequence to others, says the National Safety Council.

Fourdrinier Improvements

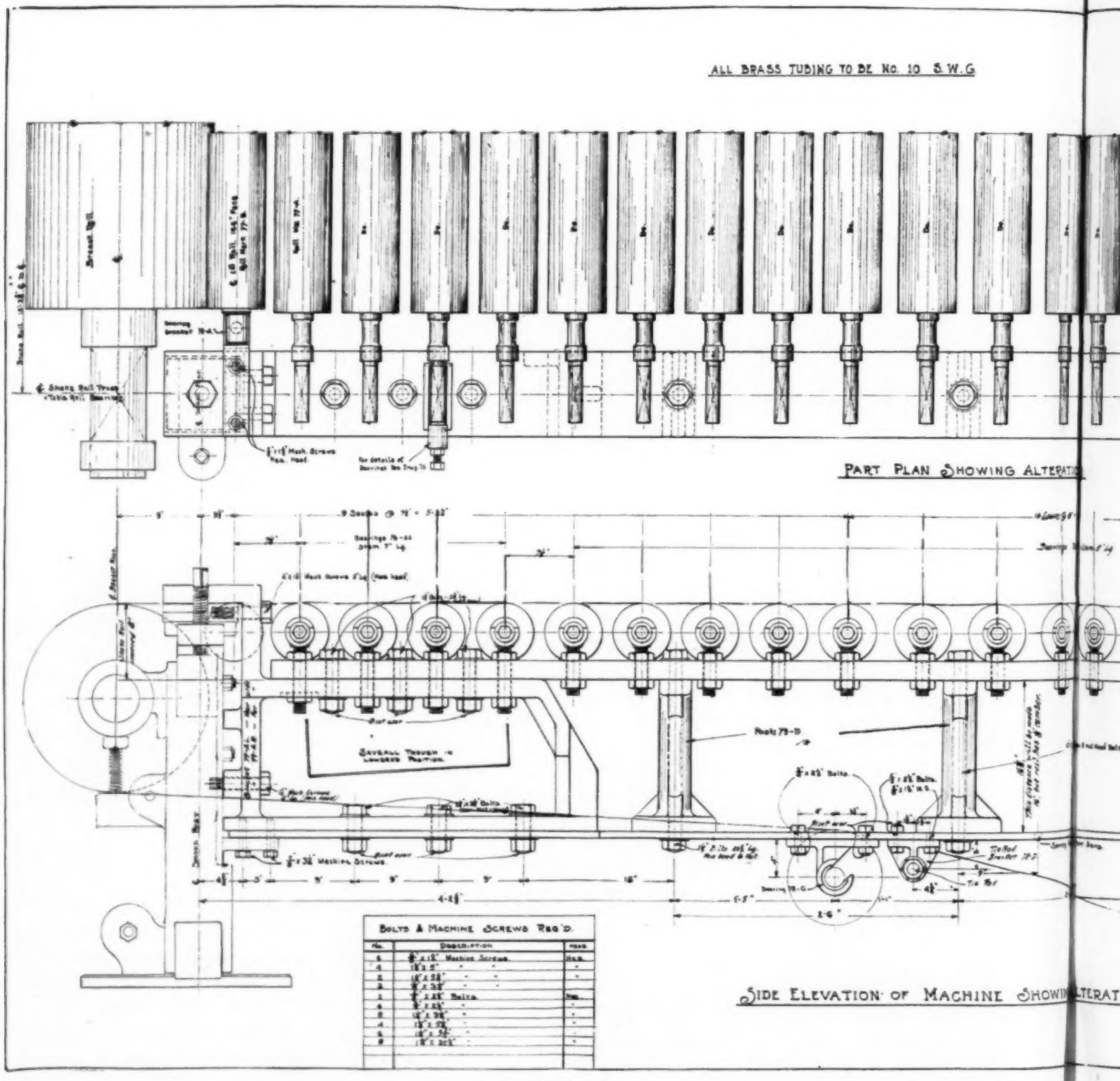
Made at the Espanola Mill of the Spanish River Pulp & Paper Mills, Ltd.

By HERBERT CANTWELL, Resident Engineer

The inception and origination of the following idea is due to the general superintendent at Espanola, Mr. W. J. Hussey, and the design and execution is due to the author of the article. Discussion is invited by the author with the hope of improving the general knowledge.—Editor.

It should be of interest to describe how a Fourdrinier of a 164 inch newsprint machine was changed, thereby making a wonderful improvement from an economical and operating standpoint.

The table roll bearings of this Fourdrinier were hung under the shake rail as are the majority of


ALL BRASS TUBING TO BE No. 10 S.W.G
PART PLAN SHOWING ALTERATIO
SIDE ELEVATION OF MACHINE SHOWIN ALTERAT
BOLTS & MACHINE SCREWS REQ'D.

Drawing No. 2

table roll bearings today. The result was a very short bearing of about 3 inches and no adjustment whatsoever.

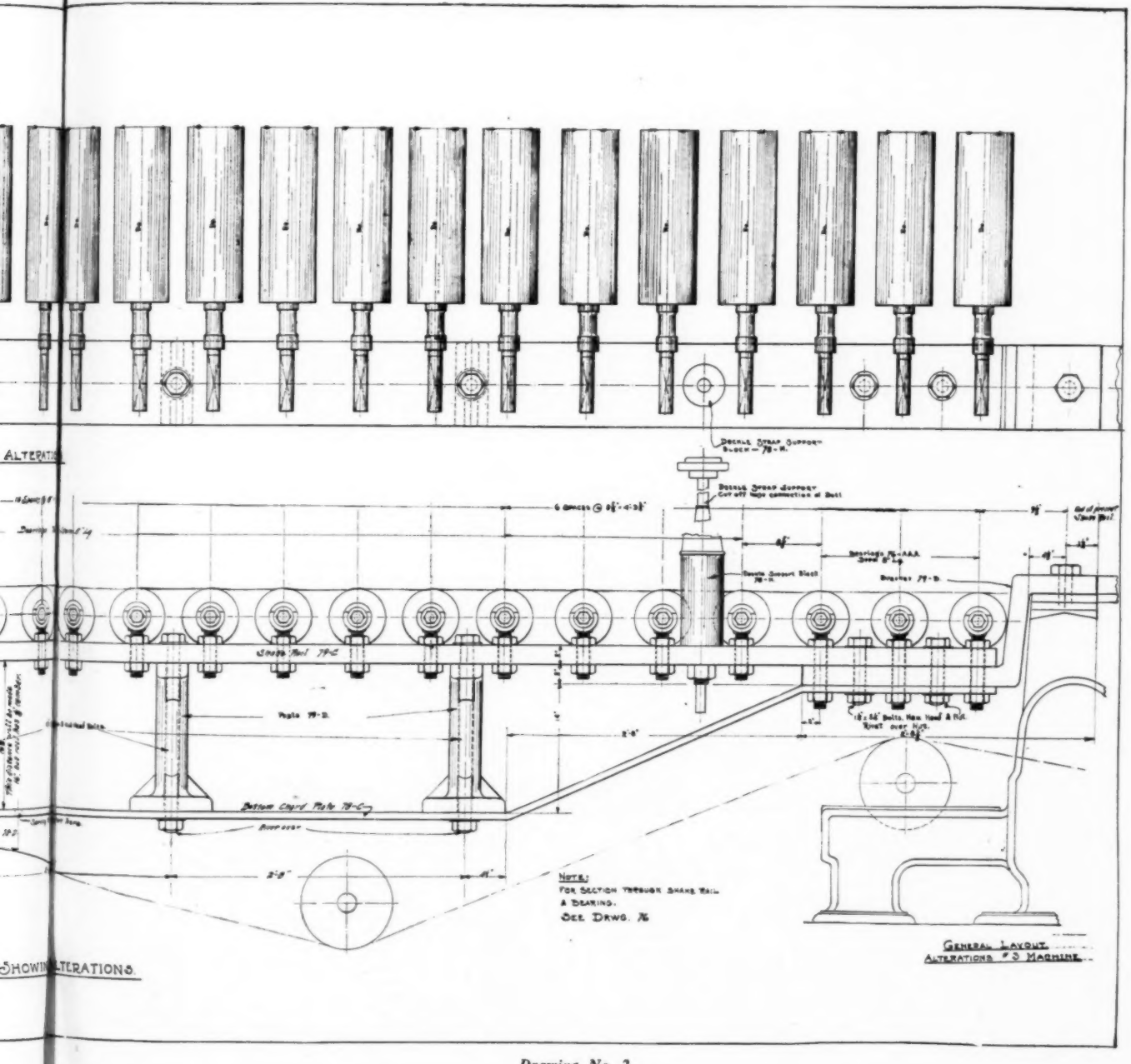
As shown on the accompanying drawings, the change was accomplished as follows:

The shake rail was cut and lowered so as to allow the bearing to be placed on its top, thereby giving a bearing of sufficient length.

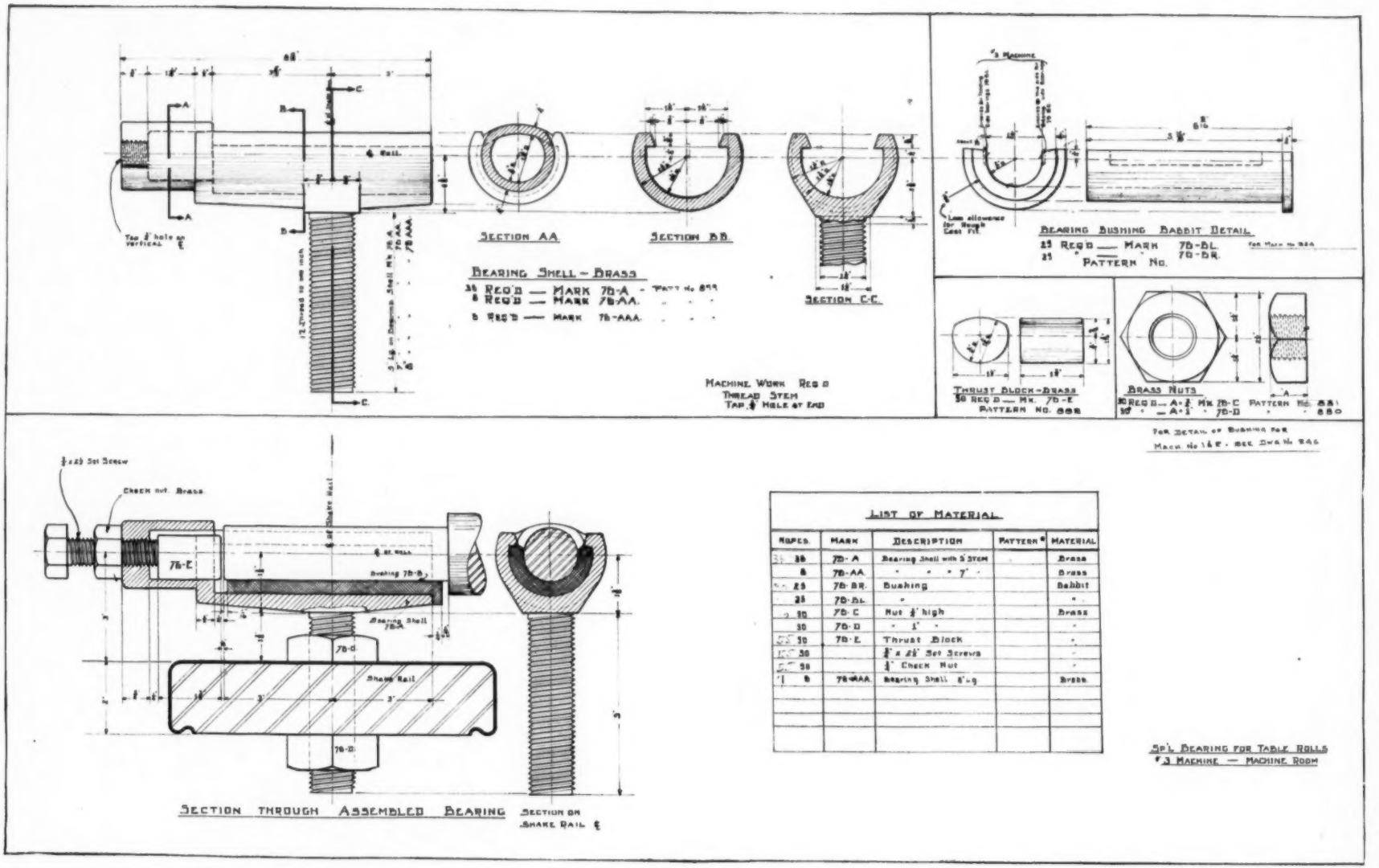
Under the old method **the bearings were continually wearing out** and **needed attention every Sunday** when the machine was down, and further the **roll shaft wore down long before the life of the table roll jacket** was ended, also it may be added that on account of **end thrust** the end of the shaft would **cut** a hole in the back side of the bracket thereby eliminating any up and down motion as required for the sheet.

A bearing was then conceived, and is hereby given to the paper industry which would not only have an up and down adjustment, but, also, an end adjustment, and which would be sufficiently long to meet the requirements as to life.

This bearing is shown in detail on drawing No. 1. It is noted that the thrust block has a flattened top which is to prevent it from turning, and, if any wear occurs on the end, it will make no difference in the

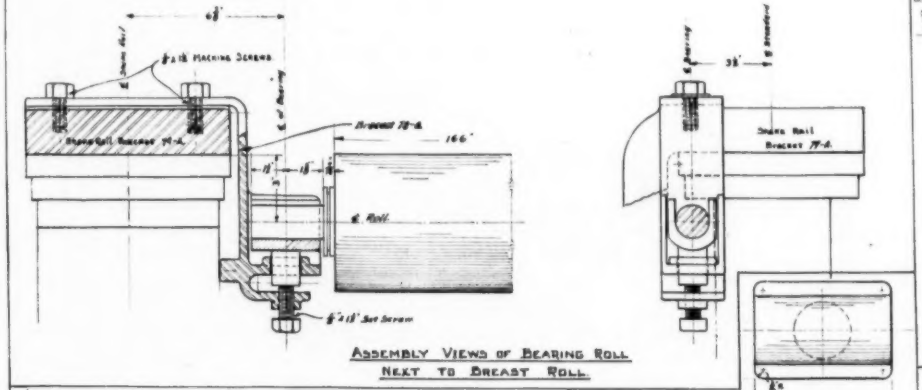


Drawing No. 2

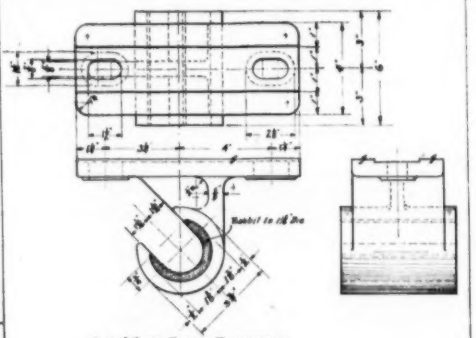

Bearing Shell – Brass
Machine Work Req'd
Thread Stem
Tap ½ Hole at End
Section AA
Section BB
Section C-C
Bearing Bushing Babbit Detail
Pattern No.
Thrust Block-Brass
Pattern No. 888
Brass Nuts
Pattern No. 881
Pattern No. 880
For Detail of Bushing for Mach. No 1 & 2 - see Dwg No 845
Section through Assembled Bearing
Section on Shake Rail ℄
List of Material
Spl. Bearing for Table Rolls #3 Machine — Machine Room

Reqd.	Mark	Description	Pattern #	Material
36	78-A	Bearing Shell with ½ Stem		Brass
6	78-AA	" " " 1" "		Brass
24	78-BR.	Bushing		Babbit
24	78-BL.	"		"
36	78-C	Nut ½" high		Brass
36	78-D	" 1" "		"
36	78-E	Thrust Block		"
36		½" x 2½" Set Screws		"
36		½" Check Nut		"
6	78-AAA	Bearing Shell 6"-9		Brass

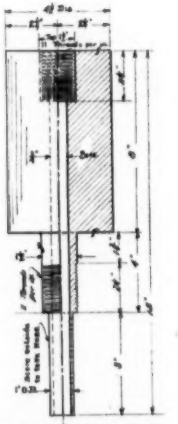
Drawing No. 1



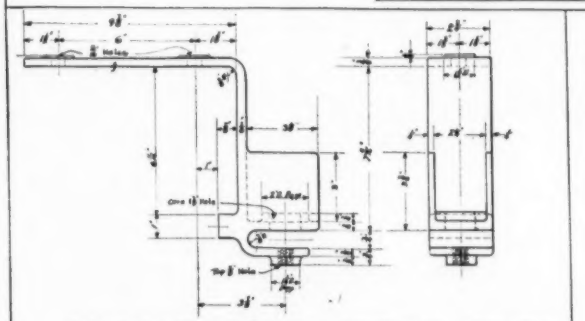
ASSEMBLY VIEWS OF BEARING ROLL
NEXT TO BREAST ROLL.



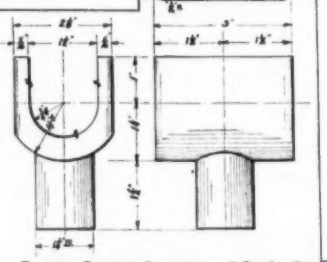
C. I. WIRE ROLL BEARINGS
2 REQ'D THUS - MARK 78-G.
HALF SIZE



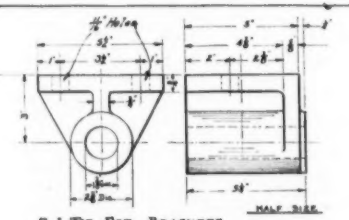
C. I. DECKLE SUPPORT BLOCK
2 REQ'D THUS - MK 78-H.
HALF SIZE



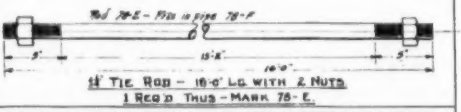
CAST STEEL BEARING BRACKET — 2 REQ'D THUS - MARK 78-A.
FOR TABLE ROLL, NEXT TO BREAST ROLL.
SCALE - HALF SIZE.



BRASS PINTLE BEARING 2 REQ'D THUS.
MARK 78-B. PATT. NO.
FULL SIZE.

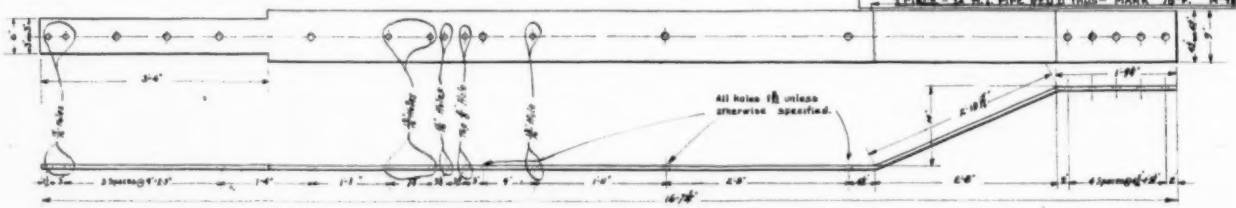


C. I. TIE ROD BRACKETS
2 REQ'D THUS - MARK 78-D
NO MACHINE WORK REQ'D.
HALF SIZE



1¼" TIE ROD - 16'-0" LG. WITH 2 NUTS
1 REQ'D THUS - MARK 78-E.

1 PIECE - 3" W.I. PIPE REQ'D THUS - MARK 78-F. 14'-9" Lg.



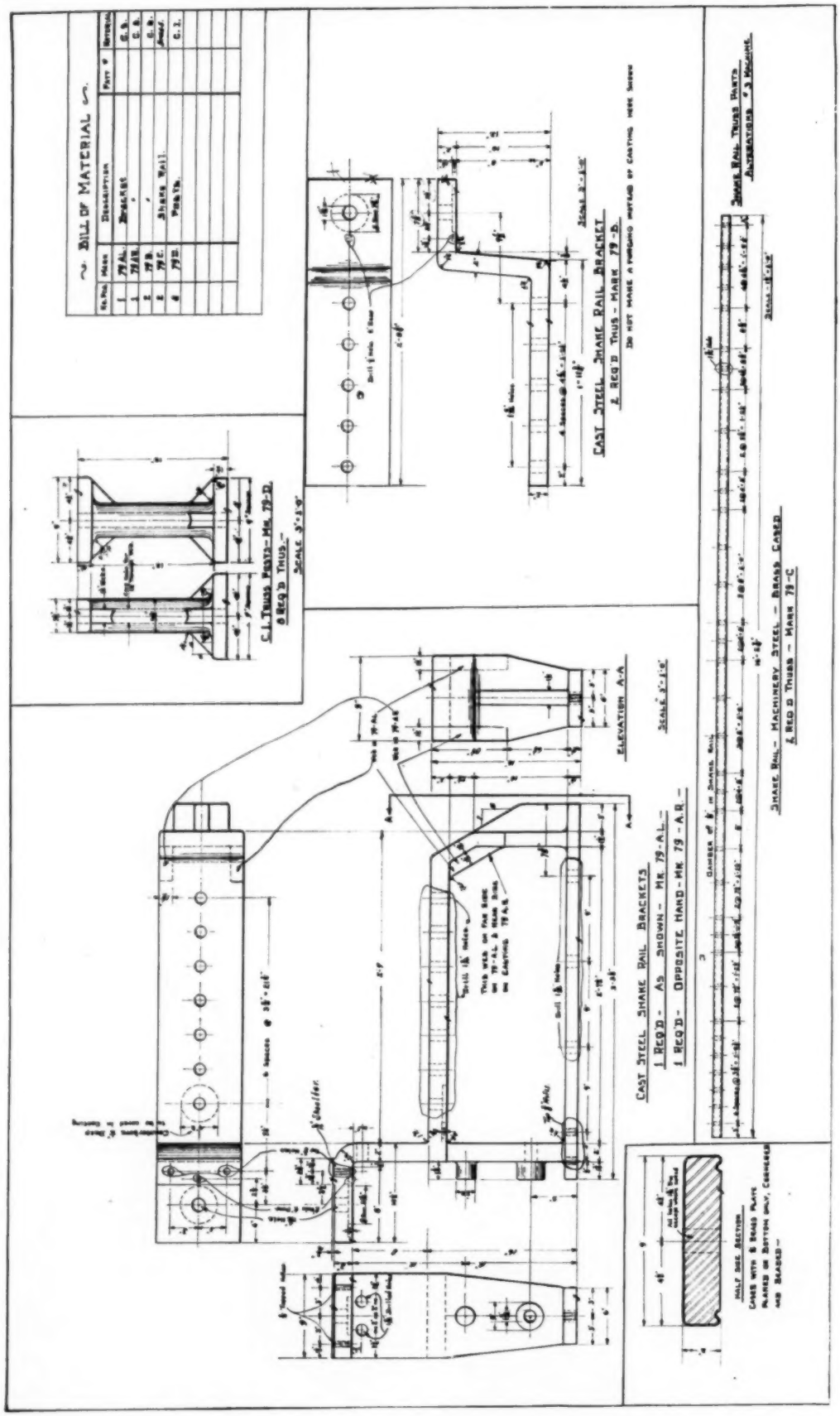
¾"x9" PLATES - BENT & DRILLED AS SHOWN - BOTTOM CHORD OF SNAKE RAIL TRUSS
2 REQ'D THUS - MARK 78-C.
SCALE 1" = 1'-0"

BILL OF MATERIAL

No. Req.	Mark.	Description	Patt. No.	Material
2	78-A	Bearing Brackets		C. S.
2	" -B	Pintle Bearings (if)		Brass
2	" -C	Bottom Chord Plate		S.
2	" -D	Tie Rod Brackets		C. I.
1	" -E	1¼" Tie Rod 16'-0" Lg.		S.
1	" -F	3" Pipe - 14'-9" Lg.		W. I.
2	" -G	Wire Roll Bearing		C. I.
2	" -H	Deckle Support Block		C. I.

MISCELLANEOUS PARTS
ALTERATIONS # 5 MACHINE

Drawing No. 4

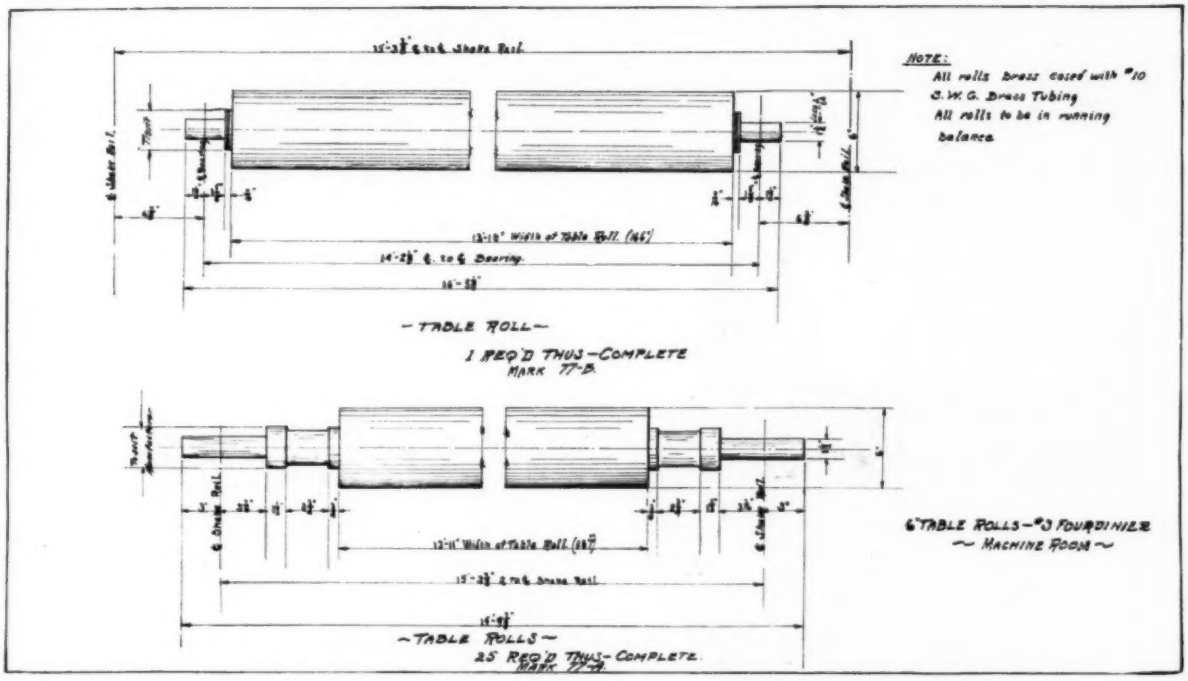

BILL OF MATERIAL
CAST STEEL SHAKE RAIL BRACKET
1 REQ'D THUS - MARK 79-B.
C.I. TRUSS PARTS - MK. 79-D.
8 REQ'D THUS.
CAST STEEL SHAKE RAIL BRACKETS
1 REQ'D - AS SHOWN - MK. 79-A.L.
1 REQ'D - OPPOSITE HAND - MK. 79 - A.R.
SHAKE RAIL - MACHINERY STEEL - BRASS CAPPED
4 REQ'D THUS - MARK 79-C
SHAKE RAIL TRUSS PARTS
ELEVATION A-A

Drawing No. 5

up and down adjustment, as there is a pocket under this end.

The top of the journal is left open, and, after the roll has been placed, a 3/4 inch layer of grease is applied, and this in turn is covered over with a piece of wet felt.

The greater facility and the greater accessibility of removing rolls in changing a wire is very marked as compared with the old method.


NOTE:
All rolls brass cased with #10 S.W.G. Brass Tubing
All rolls to be in running balance.
— TABLE ROLL —
1 REQ'D THUS — COMPLETE
MARK 77-B.
6 TABLE ROLLS — #3 FOURDINIER — MACHINE ROOM —
— TABLE ROLLS —
25 REQ'D THUS — COMPLETE
MARK 77-A.

Drawing No. 3

Drawing No. 2. shows the general layout of alterations incidental to placing these bearings on top instead of under the shake rail.

Drawing No. 3 is a detail of the table rolls. The short Baby Roll shown at the top of the sheet occurs next to the Brest Roll and was made necessary because of the old shake post which was not changed. Of course in a new machine this may be eliminated.

Drawing No. 4 shows other details and an assembly view of the journal bearing and bracket for this "Baby Roll."

It is noted that this is the one exception where it was necessary to adhere to the old unsatisfactory condition of **no end adjustment** and **small length of bearing.**

Drawing No. 5 shows shake rail truss parts.

The work covered by the above drawings was installed on the No. 4 machine nearly two years ago at a cost of $10,000.00, and more than paid for itself in the first year besides giving a better edge on the sheet and allowing greater speed on the machine. There has been no maintenance on it since its installation.

No. 3 machine has since been changed over, and No. 2 and No. 1 are about to be changed.

No. 1 and No. 2 machines being smaller than No. 3 and 4 machine, it is possible to use the shake rails and table rolls of these two machines after the necessary machine work has been done.

No. 5 and 6 machines, although installed last year, yet were bought three years ago and so they have not this Fourdrinier improvement.

However, all machines installed in the last year by the Spanish River Pulp & Paper Mills, Limited, at its various mills, have been in accordance with the above, with slight unimportant alterations, and, in the belief that there is a wonderful saving to be had, the Spanish River Company hereby gives it to the trade for what it is worth.

Brass Polishing Paste

A brass polishing paste said to give satisfactory results, is composed of camphor gum, 1 ounce; alcohol, 2 ounces; spirits of ammonia, 2 ounces; spirits of turpentine, 4 ounces; candle paraffine, 1 pound; clean tallow, 1 pound; tripoli, 1 pound. For compounding, first dissolve the camphor in the alcohol, then melt down the tallow and paraffine and stir in the liquids and tripoli. Before cooling, the paste can be packed in boxes of sizes convenient for use.

People and paper are here to meet the market of the world's need and not necessarily to please themselves. We shall be pleased, as we please others.—R. L. S.

A New Type of Soot-Blower

By ROBERT JUNE, M. E.

AN entirely new principle has been introduced in soot blower design. The valve, controlling the individual unit, has been incorporated as an integral part of the head. The resultant operating economies are, of course, tremendous. Indeed, it seems safe to say that this is the greatest advance so far made in the soot blower field.

Let us for a moment briefly review recent developments in this important branch of power plant practice. The past few years have witnessed, on the part of engineers everywhere, a marked growth in appreciation of the importance of rapid, thorough, mechanical removal of soot from the heating surfaces of steam generators. Coal and labor have constantly advanced in price. At the same time there have been unprecedented demands upon the boiler capacity of practically every boiler plant. The situation has called for systematic study of every factor affecting combustion. This analysis has proved the mechanical soot blower to be one of the best paying investments in the boiler room.

Fig. 1.—Assembled Unit. A—Location of valve in gooseneck. B—Sheave wheel. C—Gear. D—Cam. E—Lever. F—Valve stem. G—Spring

(Note: Illustration made from reversed negative in order to show trigger and cam clearly. Trigger is on left side of head, and blower revolves clockwise.)

It has been demonstrated by dozens of tests and by practical experience in thousands of plants that mechanical soot blowers will on the average, effect such important economies as—a saving of 4 to 8 per cent in fuel—an increase in over-all efficiency of 3 to 4 per cent—a decrease in consumption of steam required for cleaning, and—a marked saving in labor and labor turnover.

In view of these economies, it is not surprising to find that the largest manufacturer of mechanical soot blowers has been installing its equipment for several years at the rate of 2,500,000 H. P. annually.

A large measure of the success of the mechanical soot blower has been due to the constant improvement in design and construction. Among the improvements of the past few years are the following:

1.—The introduction of calorized metal for the protection of the blower elements from oxidation at high temperatures.

2.—The adaption of nozzles of a Venturi section to secure the highest possible velocity of the steam jets.

3.—The development of special processes for welding these nozzles in place.

4.—The designing of steel bearings to support the blower elements.

5.—The introduction of the vertical header system of piping.

The successes heretofore registered have proved a spur to further efforts. Hence, we have the new valv-in-head soot blower.

Head Constructed on New Principle

The valv-in-head soot blower is provided with a special Monel valve of the poppet type, placed at the base of the gooseneck. This valve takes the place of the globe valve which has always heretofore been installed (at a distance of two to fifteen feet or more from the head) in the riser pipe leading from the main header.

The special valve just referred to is located at the point marked "A" in the illustration, Figure 1.

The unit is operated in the following manner: The main control and drain valves, which are the only independent valves on the soot blower line, having first been opened, and all piping drained and heated, dry steam fills the line to the entrance of the individual valve at the base of the gooseneck, "A". The sheave wheel "B" is then revolved by pulling the chain. This turns a small cut pinion gear (not visible in the illustration). The small pinion engages the large gear "C" which is fixedly mounted on the blower element. As the gear is revolved, it operates the cam "D", which causes the lever "E" to press down the valve stem "F", causing the valve to open at a predetermined point in the revolution. After the gear has been further rotated, the cam "D" releases the lever "E," allowing the steam pressure to close the valve at a second pre-determined point in the revolution. As steam leaves the line, the spring "G" holds the valve closed.

Construction of Valve

The valve is made with Monel metal disc and seat. Both the stem and its retaining nut are made of nickel steel. In order to secure extra hardness which insures durability, the end of the stem is heat treated. A special feature is the provision of a guide on the seat which permits leaving the stem loose in the disc so that the valve will always seat properly. The entire construction is such that the troubles common to globe valves such as "wire-drawing," leakage, etc., are almost entirely eliminated. Disc and seat are readily accessible so that they may be removed easily for regrinding or renewal, should occasion ever require.

As the tendency toward high pressure and superheat is very marked in modern power plant design, the manufacturer makes a special steel body valve-in-head soot blower for such boilers as require this type of equipment.

Cam and Lever Construction

The movement of the cam is positive, assuring complete automatic opening of the valve at each operation. The cam and the clamps which hold it in place are made of steel. The length and relative position of the cam is individually determined for each unit at the time of the installation.

The valve lever, which is also made of steel, is designed with a ratio of two to one, and as the reduction of the gears is ten to one, the opening of the valve is as readily accomplished as if a lever with a power arm of one hundred inches and a resistance arm of five inches was used. The spring is made of chrome vanadium. As the spring is away from heat, it always keeps its tension.

Vacuum Breaker and Signal

A very unique idea has been successfully worked out in this blower. Each head is provided with a vacuum breaker for the purpose of preventing the suction of furnace gases into the blower element during the periods when steam is off the unit. In the present head this vacuum breaker has been designed in the form of a small brass whistle.

During the time that the soot blower is in operation, the whistle sounds, furnishing both an audible and a visible signal, so that there is no opportunity for the operator to leave steam on the unit for a moment during which he is not revolving the blower without the fact becoming readily apparent to any one in the vicinity.

Chain Guides

An important feature of this blower is the provision of guides to prevent the chain from slipping off the sheave wheel. It is not always convenient for the operator to stand directly under the unit, and the use of the chain guides enables him to operate the blower from any convenient point, without facing the possibility of having to hunt up a ladder in order to replace the chain on the sheave. The chain guides, in common with many other parts of the head, are made of steel.

Ball Thrust Bearings

A very marked step forward has been taken in the design through the provision of a ball bearing to relieve the friction caused by the thrust of the unit, due to steam. As will be seen from the cross section of the head, this ball thrust bearing is located directly back of the steel wall bracket which supports the blower element. Its presence relieves friction so completely that the valv-in-head unit turns as readily when the steam is on as when off.

Floating Features

The necessity for some means of eliminating the

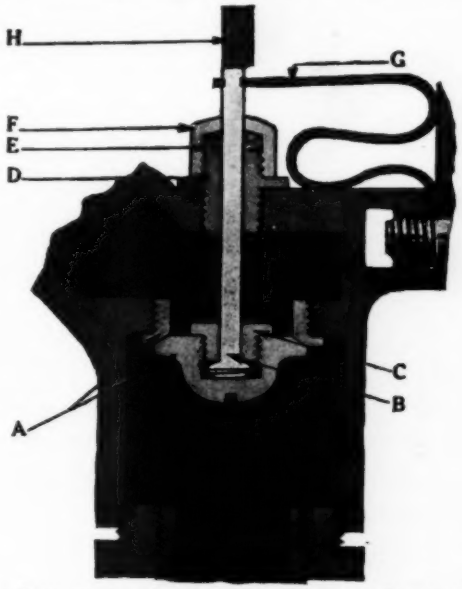


Fig. 2.—Cross section of valve. A—Monel metal seat and disc. B—Nickel steel stem. C—Nickel steel retaining nut. D—Brass valve stem guide. E—Packing. F—Nut. G—Spring. H—Trigger

binding of soot blower units resulting from movement of the boiler tubes under the forces of expansion and contraction, is now generally recognized. An important development in connection with the valv-in-head soot blower is the wall box, with floating mechanism, which provides a means of taking care of any shifting of position of the blower element without causing dislocation of the wall box, cracking of brick work, or expansion strains on soot blower head and brackets.

Advantage of This Type of Soot Blower

The advantages of the valv-in-head soot blower as compared to soot blowers of the independent valve type, fall into two general groups:

DIRECT ECONOMIC ADVANTAGES

1.—LABOR—a saving of approximately 50 per cent.

2.—STEAM—a saving of 20 to 50 per cent or more.

3.—PIPE, VALVES AND FITTINGS—a saving of 50 to 66 per cent in cost of pipe, valves and fittings.

4.—MAINTENANCE—a reduction in annual charges of 25 to 50 per cent or more. Practically complete elimination of condensation obtained.

5.—EFFICIENCY—greater cleanliness of boiler assured.

INDIRECT ECONOMIC ADVANTAGES

The following advantages, while primarily of a mechanical nature, have an important dollars and cents value.

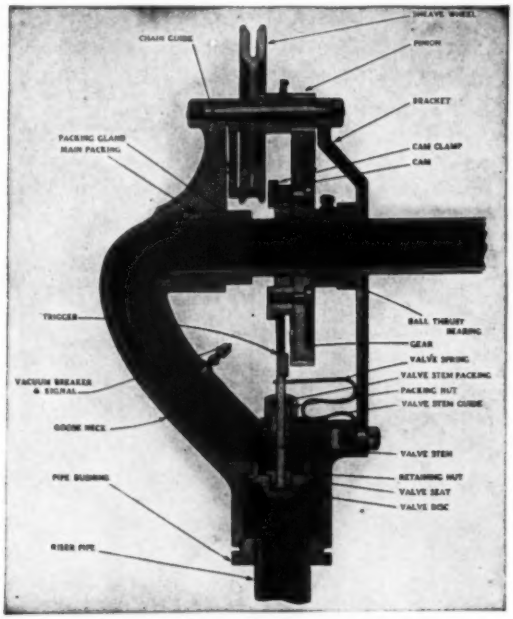


Fig. 3.—Cross section of Valve-in-Head Soot Blower

6.—INTERCHANGEABILITY—especially adapted to replace other blower heads.

7.—ONE MODEL STANDARD—head is made in one size for all boilers.

8.—CONTROL—steam may be intermittently discharged over two or more arcs in revolution. Arc or arcs of steam jets within boiler invariably cover exact predetermined limits. Speed at which blower element may be revolved is so controlled by reduction gearing as to make improper operation extremely unlikely. Unit provided with visible and audible signal to indicate valve open.

9.—ONE DIRECTION OPERATION—revolution is always clockwise; hence blower element cannot work loose from head either partially or entirely.

10.—EASE OF OPERATION—gearing and ball thrust bearings overcome friction.

11.—VALVE DESIGN—time of opening and closing exactly adjusted to soot blower operating conditions, being slower than the standard quick-opening valve and faster than the standard globe valve, thus solving a problem of long standing. Quick-opening valves have the disadvantage of causing a sharp thrust of the unit, due to rapid admission of the steam. With globe valves the tortuous passages cause marked reductions in effective pressure. There are also losses of time and of steam, from the slow opening and closing—losses which may seem of small amount as respects a single operation, but which become important when spread over a period of time and a number of boilers.

Elimination of Condensate

One of the most important results of the use of this blower is the practical elimination of the possibility of water entering the portion of the soot blower inside the boiler. With the independent valve type of soot blower, the valve is located anywhere from 2 to 15 feet or more from the head. This means that condensation will inevitably take place when the valve is admitted to the cold line. The water thus formed is driven through the soot blower head and into the blower element.

In addition to the condensate thus formed in the line, a more serious possibility is that a small leak in the valve will cause water to form in the pipe before the valve is opened. When this occurs, a solid column of water may be built up in the riser pipes and carried over into the boiler when the valve is opened.

The presence of this condensate in the hot blower element is apt to cause warping, and its discharge on the boiler tubes may cause the soot to pack, forming a gummy mixture hard to remove.

With the valv-in-head system, any condensate in the main supply line is discharged through the drain pipes before blowing begins. There is, therefore, no water below the valve which can be carried into the blower head, and the radiation area in the head itself is so small as to be negligible. Hence we have practically complete elimination of condensate from the blower element.

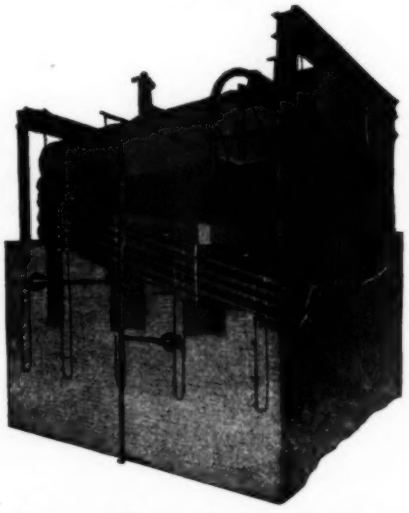


Fig. 4.—Application of Valve-in-Head system to horizontal water tube boiler, vertically baffled

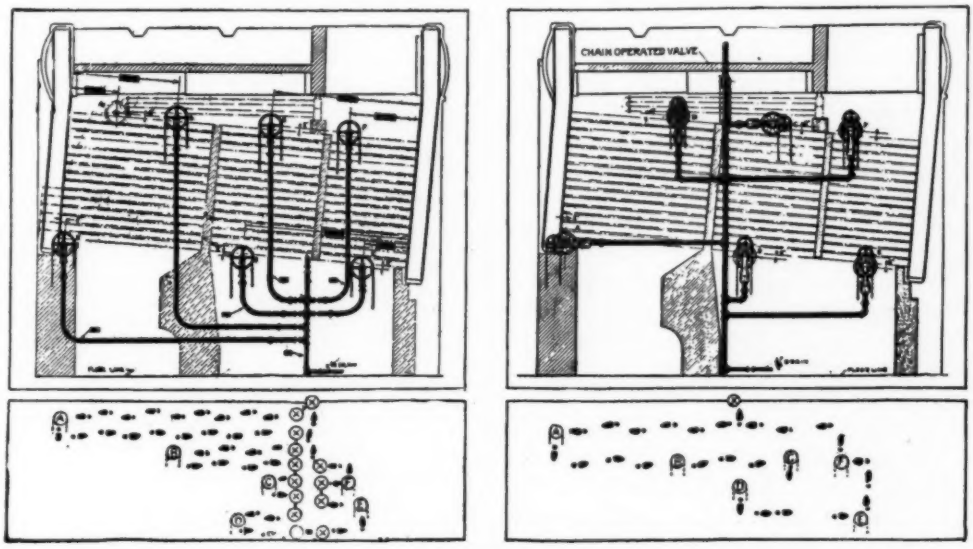
Saving of Labor and Steam

With this system, the length of time of blowing is cut squarely in half. There is no working back and

forth from chain to valve. A single round trip completes the cycle of operations. This effects a marked saving in labor.

Furthermore a saving in steam of 20 to 50 per cent, or more, is effected. This saving is a result of the cutting down of losses which occur with the independent valve system when the operator walks back and forth from valve to unit, steam being discharged all the time the man is in motion. Steam is also saved as a result of the valv-in-head blower being within the boiler. The jets blow only when the nozzles are directed at parts of the boiler from which deposits of soot must be removed. The steam is automatically cut off from the blower element at the precise point in the revolution of the blower element at which the jets would begin to strike the baffles or other parts which might possibly be affected by contact with the live steam.

A striking advantage is that the cam may be so constructed as to permit blowing of the unit at two



Saving steps saves steam. The operator of the independent valve system at the left must retrace his steps as shown. Steam is discharged and wasted all the time he is in motion. With the new system at the right the operator makes a single round trip. No steam whatever is discharged while he is in motion

designed for operation at a pre-determined speed, as this has a marked effect in producing regularity of operation, the blower never being left open longer than the time actually required.

Greater Cleaning Efficiency

A very marked advantage in the use of the herein described soot blower is the increase in effective pressure in the blower element. This is due to two factors. First—the valve offers practically a straight passage to the steam, whereas the steam must take two right angle turns through the globe valve, which causes an appreciable drop in pressure. Second—the system requires about half the quality of pipe and fittings used with other blowers and on this account the pressure drop from source of steam to blower element is very much less.

The outstanding advantage of this increase in effective pressure is, of course, the increase in cleaning efficiency of the steam jet. With increased velocity, the range of the steam jets is considerably greater, and the boiler is more thoroughly cleaned in all respects.

Control of Direction of Jets

One of the results achieved by this design is the positive control of the direction of the steam jets or more arcs in the revolution. This means that steam may be cut off when the jets approach a baffle and turned on again when the baffle is passed.

With oil fired boilers, this ability to control the arc of the steam jets is a particularly valuable feature, since it makes possible the avoidance of interference with draft to the detriment of combustion.

Gear Reduction Assures Proper Speed of Rotation

Heretofore, it has been a problem to regulate the methods of blowing used by individual members of the boiler room crew. Where one fireman would operate the blowers slowly and in accordance with directions, the next one would yank the chain, spin the blower around and consider that he had done a thorough job of cleaning.

Actually, of course, the boilers are only effectively cleaned when the steam jets play on the tubes for a pre-determined period of time. The gear reduction arrangement provides for the revolution of the soot blower element at a speed regulated to conform to the proper length of time for blowing.

Saving in Pipes, Valves and Fittings

With this type of soot blower system, a saving is

effected of practically two-thirds in the actual length of pipe required.

In Tables I and II, there are given comparative bills of material on a vertical boiler of the Stirling type, for a six-unit soot blower installation of the independent valve system, and the herein described system.

TABLE I.

Bill of Material Independent Valve System
Six Unit Stirling Independent

1	—2½" Main Control Valve	$ 36.01
6	—2 " Individual Valves @ $24.28	145.56
1	— ¾" Drain Valve, Bushing, Nipple	6.38
28.5	—2½" Pipe for Main Line @ $.461	13.15
9	—2½" Unions, Ells, Crosses, Tees	11.39
83	—2 " Pipe for Individual Risers @ $.302	25.07
12	—2 " Unions @ $.99	11.88
		$249.44

Prices as of May 1, 1921.

Note: Above estimate based on "Bronze body valves, nickel seats and discs for pressure of 250 lbs."

For "all steel fittings, with steel body valves, nickel seats and discs" cost would be $404.30.

TABLE II.

Bill of Material Valve-In-Head System
Six Unit Stirling Installation

1	—2½" Main Control Valve, with 35' operating chain	$45.01
1	— ¾" Drain Valve, Bushing, Nipple	6.38
27'	—2½" Pipe for Main Line @ $.461	12.45
11	—2½" Tees, Unions, Ells, etc.	12.16
25'	—2 " Pipe for Individual Risers @ $.302	7.60
9	—2 " Unions, Ells	7.23
		$98.83

Prices as of May 1, 1921.

Note: Above estimate based on "Bronze body valves, nickel seats and discs for pressures of 250 lbs."

For "All steel fittings, with steel body valves, nickel seats and discs," would cost $164.82.

With this six unit installation, the saving in cost of pipe, valves and fittings effected by the valv-in-head system is approximately 64 per cent. The comparisons are:

Using "Bronze body valves, nickel seats and discs."

Independent valve system	$249.44
Valv-in-head system	90.83
Saving by latter	$158.61

Using "All steel fittings, steel body valves, nickel seats and discs."

Independent valve system	$404.30
Valv-in-head system	164.82
Saving by latter	$239.48

Even should very cheap valves be used, the savings effected by the valv-in-head system would amount to 50 per cent.

Future Assured

This new soot blower presents so many striking advantages that its future is assured. Indeed, it opens a new page in the history of power plant development.

Beating, Sizing and Loading

By GEORGE TEREN

American Writing Paper Company

A lecture delivered by the author before the class in Papermaking, at Neenah, Wisconsin, February, 1921. Material furnished by the State Board of Education under the provision of the Wisconsin Educational Bonus Law, copyright privileges reserved by the University Extension Division and the State Board of Education, jointly.

ONE of the most important steps in the evolution of the manufacturing of paper occurred two hundred years ago when the Beater Engine was invented by a Dutchman. Previous to that time the so-called stamping mill was used. The stamping rods consisted of long wooden bars actuated by wooden pallets on a shaft driven by a cog-wheel. The pallets caused the rods to be raised up and dropped into an iron trough or pan containing rags and water. The stuff was given this treatment until the fibers were reduced to such an extent as to warrant the forming of a sheet of paper. It is said that fifty of those stampers could convert one hundred and twenty-five pounds of rags into pulp suitable for paper, every twenty-four hours. Today, an ordinary Beater Engine of the Holland Type, practically the same kind of engine that was invented two hundred years ago, will convert forty-five to fifty hundred pounds of the best kind of rags into good pulp every twenty-four hours.

The first Holland engine consisted of an oval shaped wooden tub partly divided by a partition running length-wise through the center, leaving a passage at each end of approximately one-sixth of the entire length of the engine. At one side was fixed a revolving wooden roll fitted with steel knives. This roll was caused to bear on a so-called bedplate also fitted with steel knives. The revolutions of the roll caused the stuff to pass between the knives of the roll and the plate and around the tub, the so-called mid-feather being of such length as to allow the pulp to make a complete circuit.

The engine of today (speaking of what is called the straight Hollander—leaving off all the patented off-

springs of the first engine) has a few improvements as to the roll and the design of the tub. The roll is now made of cast iron. The cast iron roll has an advantage over the wooden roll in that it is heavier, thereby giving a wider range of pressure which gives the beater man more control of the operation, as well as enabling him to perfect the stock more rapidly than could be done with a wooden roll. To offset this the procedure of beating had to be prolonged to get the result desired. The improvements on the tub have been made by designing it in such a way as to increase the circulation of the stock, thus hastening the process.

The half-stuff, as rags and wood pulp are termed at the stage where it is suitable for the beating engine, is, as the name indicates, not yet ready for the paper machine. The fibers are not uniform length. They lack certain physical properties which are necessary before they can be made into a particular kind of paper. This pulp or half-stuff must be broken up and the individual fibers separated no matter what kind of paper it is to be made into. When the fibers are passing between the roll and the plate in the presence of water, they undergo peculiar changes besides being separated from each other and reduced in length. The longer this process is continued the more pronounced these changes will be. After two or three hours of treatment, if the hand is put into the stock, one experiences a greasy or slimy "feel" which is quite noticeable when compared with the "feel" of the stock at the beginning of the beating.

The beating causes the cell wall of the fiber to take up water and to pass into the condition of a gelatinous hydrate. In proportion as this change is effected, the stuff is said to be wet or slow, or, to use another word, the stuff is being hydrated. The fibers are drawn out or flattened, in some instances they are split. The degree of this so-called hydration and the manner in which it is brought about determine to a great extent what kind of paper can be made out of a particular stock. If the beating is done rapidly, when using a sharp tackle, a low degree of slowness or hydration is obtained. If the procedure is carried out in a slower way, that is, if the beating is more of a brushing and a drawing out action of the roll, and the pressure of the roll applied gradually, in proportion with the increasing hydration of the fibers, a highly hydrated or so-called "slow stuff" is the result.

In making blotting paper a rapid, cutting action is necessary in order to obtain the qualities and characteristics wanted.

The original characteristics of the fiber, such as capillary attraction, is preserved as much as possible so as to give the paper the ink absorbency needed. The only work done by the roll in this instance is to separate and cut the fibers into proper length. If a bond or a ledger paper is to be made, where the desired requirements are entirely opposite to those of a blotting paper, the beating must be done in a different way. In beating the stock for this paper, the strength, firmness, and felting of the fibers must all be borne in mind in order to obtain a certain formation. Of course, the particular kind of fiber used determines the quality to a great extent. Assume that the beater is furnishing the beater with one hundred per cent sulphite. As soon as the beater is filled the roll is let down to a light brush. If the beating time for this particular paper is specified to be five hours, the procedure of beating would be as follows: After the beater is furnished, the roll is lowered to a light brush. It is kept in this position for one hour, when it is again lowered a trifle and kept in that particular position for three hours. Observations should be made from time to time and care taken to insure that the fibers are not reduced too rapidly. At the end of four hours the roll should be lowered again, proper care being exercised to prevent the fibers from being cut too short. After the roll has been in this position for one hour, the stuff is ready for the refining engine to be reduced to the length desired for the paper machine. The change in the pressure of the roll is made twice after the first brush. After one hour of beating, the stuff has become hydrated to some extent, the individual fibers having taken enough water to make them tougher and more pliable. An increase in the roll pressure at this time proves beneficial, providing, of course, that good judgment is used and care taken when adjusting. In case the rolls bear down too hard on the plate, a cutting action takes place which prevents the desired maximum effect of hydration.

There are beaters in operation at the present time in which the actual roll pressure is regulated by a hydraulic lift attached to the lighter bar, the desired pressure being obtained by the opening and the shutting of a valve. This pressure is indicated and registered in the form of a curve on a connected recorder. This curve gives a picture of the procedure, so to speak. However, its value as a record for future use, that is, its use as a guide and reference for the next time the same paper is made, may not be so great as claimed. There are several other factors which must be known before this chart can be of value as a record, such as the rate the stock travels in the beater, and the consistency of the stock.

Having explained what changes in the stock are taking place when beating, and giving an idea of the different treatment given to two distinctly different kinds of papers, several factors that play an important part in the beating process will now be mentioned. The hydration effect on the fiber is brought about through the rubbing and brushing of the fibers between the roll and the plate. Therefore, the so-called working surface, that is, the area of the steel bars in the plate, is where the real work is done. After the fiber or fibers have passed through, they start out on a long journey again with the roll and plate as the goal. They will make the rounds as

often as 60 to 70 times an hour. In some special types of beaters the rate of traveling is double and sometimes three times this. It is readily understood that the faster the stock travels the oftener it comes into contact with the roll and plate, consequently, the desired hydration of the fiber takes place more rapidly.

Then comes the question of the consistency of the stock. As a rule, the beaters are furnished up to a consistency of 5 per cent except in beaters of special design, where as high a percentage as 8 per cent is common. A high consistency is considered to be of great value, when beating, as a more uniform treatment can be given to the stock. There is also a certain action between the fibers, a kind of rubbing against each other caused by the circulating forces, which is said to promote hydration.

In late years bed-plates made of granite and lava have been introduced. Rolls with a stone filling are also used. This latter kind of equipment is not suitable for beating rags, but is said to be very good for use on wood pulp. This equipment is especially noted for giving very quick beating results, the reasons being a large working surface and the brushing action instead of cutting. These plates and rolls are used in the beating of kraft and glassine papers.

Sizing

If the beating is carried on for any length of time, say from thirty to forty hours, the gelatinous characteristics of the fibers is quite noticeable. If the fibers are made into a sheet of paper at this time, a brittle, transparent, and to some extent ink-resistant paper will result. However, in papers beaten for a shorter time this no-absorbent quality is not nearly so pronounced, and, therefore, certain sizing agents have to be used. The degree of sizing and the kind of sizing material to be used depend on what the paper is to be used for. Newspaper is only slightly sized, as the ink must be dried very rapidly in the process of printing. Papers used for lithographic printing are medium sized or fairly hard-sized. Ledger and writing papers must be very hard-sized so as to prevent the ink from spreading or blurring.

In practically all papers made today that are sized, the operation is carried out in the engine during the course of beating. The agent used is rosin. Rosin is the residue obtained in the distilling of crude turpentine. It is graded commercially according to color, the different grades being denoted by letters. Grade A is a deep dark brown; W-W is nearly white or light amber. In the sizing of paper, the best results are obtained from using grades F, G, and H.

There are nearly as many methods for making rosin size as there are mills. The principle of combining the acid rosin with an alkali to make the rosin soluble must be followed. For this reason soda ash is commonly used, as it is considered to be the best for the purpose. The crude rosin is first put into a steam jacketed iron tank and melted. Soda ash is then added and boiled with the rosin from four to six hours. The "cook" is then drawn off from the cooking tank and put into a so-called storage tank from where it is again taken and dissolved in water and finally screened, ready for use in the beater.

The amount of soda ash to use depends on what kind of size is wanted. If a neutral size is wanted the theoretical amount of soda ash needed is about 17.5 per cent, this amount being sufficient to give a neutral resinate of soda. If an acid size is wanted, that is, a size containing uncombined or free rosin, a smaller percentage of soda is used. In some mills a neutral size is used. A rosin size containing a high percentage of free rosin is coming into use more and more, since it gives a better sizing effect with less rosin.

The rosin size is added to the stock when the beater is three-fourths furnished in the case of a wood pulp furnish. It is usually added to a beater furnished with rags when the stock has been beaten two-thirds of the required time. The sizing is not completed even after the rosin milk is added. The rosin must be precipitated on the fiber which reaction is completed during the drying process on the machine. Acids and acid-salts may be used as precipitants. Aluminum sulphate has been found to give excellent results and is used exclusively. Alum is used for precipitation at the ratio of 2 : 3—2 rosin, 3 alum.

The amount of rosin used in writing paper is about 2 per cent. If a high-free rosin size is used, the amount can be cut down to as low as 1 per cent and still have a well-sized sheet. Special papers that have to be extremely hard-sized may take as much as 5 to 6 per cent.

Starch is used in the beater for several reasons. It will give sizing effect to the paper, increase the bursting strength, and in the case of highly furnished flats and Index Bristol, where the use of clay is prohibitive, it will give a smooth and glossy surface. Starch is used to a great extent for surface or tub-sizing, replacing glue more and more. The starches used for this purpose have to be chemically treated before they can be used, as the raw stock cannot be brought down to a thin boiled solution with enough starch present to be effective. So-called thin boiling starches used for tub-sizing are now on the market under names of Hercules Gum, etc. All writing and drawing papers as well as Index Bristols are tub-sized.

Fillers

Most papers, especially those used for lithographing and half-tone printing, contain some loading material, or filler as it is also termed. The reasons for using filler in the manufacture of paper are several, the chief reason being to get a uniformly smooth and soft surface that will suit the requirements for the kind of printing that is going to be done on the paper. Thin papers, such as bible papers, and other lightweight book papers, must have loading to increase the

opaqueness of the paper, thus making it suitable for printing on both sides of the sheet.

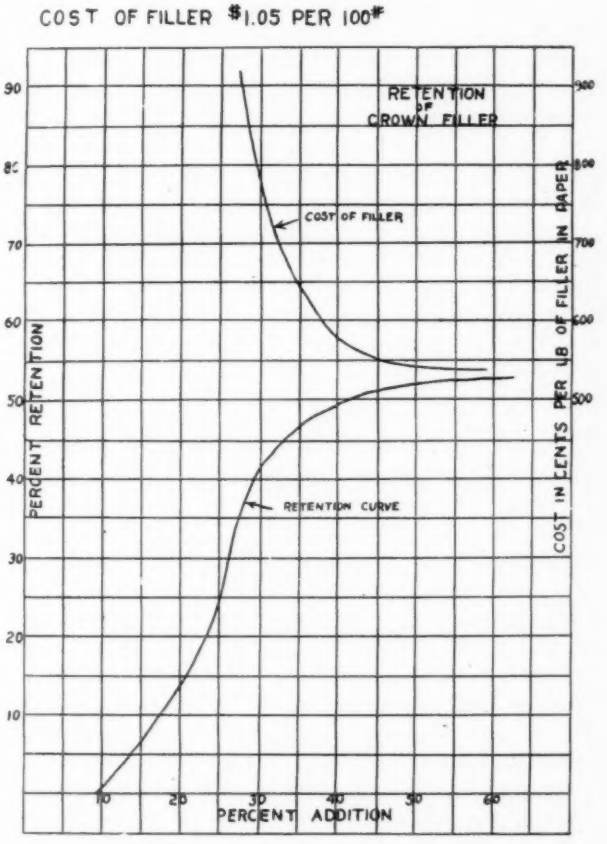
The most commonly used fillers are clay, talc, agalite, and crown filler. Clay or China Clay, as it is sometimes called, is a hydrated silicate of aluminum, formed by the weathering of feldspar. It is a bluish white substance having a smooth and greasy feel. It is used more extensively than any other filler because it is the cheapest. The amounts used in papers range from 5 to 45 per cent. In low-grade papeteries and writings up to 10 per cent is used. Highly finished book papers contain sometimes as much as 45 per cent of clay; newspapers up to 10 per cent. Clay has a better color than talc or agalite but not so good a color as crown filler. Clay is not as a rule added dry directly into the beater. It is usually mixed with water, one to two pounds of clay to one gallon of water. It is strained before it is added to the beater.

Talc is a hydrated silicate of magnesium. It is a natural filler and is largely found in Vermont and northern New York. In color, talc is not nearly so white as clay, its color being more of a grayish or greenish white. The retention, that is, the proportion of the added amount of filler retained in the finished sheet of paper is higher when talc is used than when any other filler is used. Agalite and asbestine are chemically identical to talc. The better grades of agalite have a whiter color than the common talc and are, therefore, more suitable for use in some of the better grades where, if talc were used, a good bright white color could not be obtained.

Crown filler is another widely used filler. It is a hydrated calcium sulphate manufactured by precipitating a solution of calcium chloride with sodium sulphate. It is found on the market under many names, such as pearl harding, alabastine, and annaline. Crown filler is whiter than any of the other fillers on the market and is used in high-grade papeteries, index bristols, etc., where high-grade white colors or delicate tints are required. It is received into the mill as a white powder containing about 33 per cent total water, chemically combined and mechanically mixed. It is the most soluble of the fillers, and it is said that over 30 pounds will dissolve in 1,000 gallons of water in an ordinary room temperature. An ordinary 1,000-pound beater will contain at 5 per cent consistency of fiber about 2,500 gallons of water. Therefore, when the solubility of crown filler in water is approximately 30 pounds per 1,000 gallons, about 80 pounds of the filler is dissolved. On this account it is necessary to add about 10 to 15 per cent before any of the filler added will be retained in the paper. It will give a maximum retention when about 60 per cent is added. Pearl filler is chemically the same as crown filler, but it is not manufactured artificially, being found in nature and mined as other mineral fillers. Its color is not so good as that of crown filler but a considerably higher percentage is retained when it is used.

The retention of a filler is varied according to the machine speeds and stock changes. The slower the stock, the better the retention. The retention is higher in a long and slow stuff than in a short and slow stuff. Good sizing increases the retention.

The following data by Campbell are based on paper having a folio weight of 20 pounds—17x22—500 sheets, an addition of filler of 10 to 20 per cent and a machine speed of two hundred feet per minute. The



figures are average results, the papers being writings and envelopes with a few books. The retention to be expected in book papers of medium weight is probably about 10 per cent lower than these figures.

Talc, 82 per cent.
Agalite, 75 per cent.
Clay, 70 per cent.

For crown filler the following average figures are given for the same sheet of material and average machine speed. The papers were writings and papeteries:

Crown Filler	Per cent added	Per cent retained
	10	0
	20	14
	30	40
	40	49
	50	52
	60	53

The proper time for adding filler is generally thought to be as soon after furnishing as possible. It should be added before the size and alum.

Safety and the Manager

The Importance of His Support, and How to Get it

BY C. W. PRICE

General Manager, National Safety Council

SAFETY in a plant must begin at the top. The manager and the superintendent must believe in it as a business proposition, just as they believe in fire prevention or anything else that prevents waste and increases efficiency. They must give safety a dignified position in the organization, get back of it, and stay back of it so unmistakably that every foreman and workman will know what the officers propose to do to make the plant safe and what they expect the foremen and workman to do. Without this backing from the manager and the superintendent a safety engineer can do little in reaching the workmen and in awakening the real safety spirit.

How to Convince the Manager

Managers and superintendents do not neglect safety because they are inhuman and indifferent to the welfare of their workmen. It is because they are not informed as to what has been accomplished in accident prevention; they do not know that safety pays good dividends on the investment.

If your manager and superintendent are not interested in accident prevention, or if they do not give you the support you need, your first duty is to convince them by placing before them the experiences of other companies that are doing successful safety work. A manager is always interested in what some other company is doing and the savings which are being made. He must be convinced by hard facts. Here is the experiences of six members of the National Safety Council:

The Commonwealth Steel Company, Granite City, Illinois, reduced the cost of accidents during the five years ending December, 1918, from $40,000 to about $4,500 per year. During three months in 1918, with 2,500 men, they had no compensation case. They have eliminated eye injuries among the chippers and grinders.

The Eastman Kodak Company, Rochester, N. Y., during the first five years of its safety work reduced lost time accidents 80 per cent, and reduced the annual cost of accidents from $35,000 to $3,500.

The Omaha Plant of the American Smelting and Refining Company, comparing the record of 1916 with 1915, reduced lost time accidents 90 per cent and eliminated deaths. With a thousand men they made a record of running four months without having a man sufficiently injured to cause a loss of over twenty-four hours.

McClintic-Marshall Company, near Pittsburgh, fabricators of structural steel, with a force of 1,050 men, reduced the cost of compensation during 1917 to 12½ cents per $100 pay roll, which is about one-third of the usual insurance premium for a clothing store.

The United States Steel Corporation during the first eleven years of safety work saved 19,815 men from being either killed, permanently crippled, or so seriously injured as to lose over thirty-five days time. This is in comparison with the record of 1906. In the Gary Plant, the South Works, and the Joliet Plant (Illinois Steel Company,) serious accidents have been reduced over 80 per cent. In the McKeesport plant of the National Tube Company the record of 1916 compared with 1912 showed a reduction of 84 per cent in lost time cases.

The International Harvester Company, with twenty-three plants, including coal mines and a steel plant, as well as foundries, machine shops, and woodworking shops, during the first five years of safety work reduced the cost of compensation to 25 cents per $100 pay roll. In their steel plant and several of the largest harvester plants, serious accidents were reduced more than 75 per cent.

Such examples as stated above should be recognized by the paper industry, as the opportunity to save in like respects exists as well in this industry as in any other.

It is also important that you place before your manager and superintendent an outline of the methods which these companies use in accomplishing these results. Emphasize the point that at least one-half was accomplished through organization and educational methods.

In presenting your plans for a safety campaign, you must convince the manager that your plan includes the standards used successfully in all companies which are doing efficient safety work.

What the Manager and the Superintendent Can Do

In starting a safety campaign, your manager should call a meeting of all foremen and sub-foremen, at which he should preside. He should outline the plan and state what the company proposes to do to make the plant safe, and what the officers expect of every foreman. The manager should seek to convince the foremen of the practicability of the proposed plan by placing before them the experience of other companies. He should emphasize the point that from

this time on safety must be recognized as an indispensable part of an efficient department; a foreman's first duty is the protection of his men. At this meeting the manager should announce regular monthly meetings of the foremen. He should request each foreman to make a rigid inspection of his department and to submit within a week a written report of all points which should be guarded, indicating those which should be considered first.

The company must first do its part—must convince the workmen by visible signs in the form of mechanical guards—before the foremen can go to the men and ask them to co-operate.

After considerable guard building has been done, and after the manager and superintendent have succeeded in interesting the foremen, then a meeting of all employes should be called. At this meeting the manager and superintendent should speak, and should lay before the men the causes of accidents, emphasizing the point that a large percentage cannot be prevented by anything which the company can do. They should drive home the fact that the workmen are a thousand times more concerned than the company; they may lose their limbs or their lives—the company only loses money.

The manager should announce the new plans for safety work and should place the company and himself on record as willing to do anything possible to protect the men—if they will do their part.

The superintendent should announce the names of the workmen who are to serve on the workmen's inspection committees, and emphasize the importance of their work.

Not only should the manager and the superintendent give the safety campaign their support at the start, but they should actively identify themselves with the movement so that the foremen and workmen will be constantly reminded of their interests.

The superintendent should attend all foremen's meetings, and act as chairman. The manager should frequently attend and express his deep interest in safety.

To keep the manager and superintendent in close touch with the work, the safety engineer should place on their desks each week a brief report covering serious accidents, progress of safety work, and new suggestions. He should do everything within his power to visualize the suffering and consequences of accidents, and their cost in money, to the company. Ask the manager to visit one of the injured men at the hospital and see for himself the horror of accidents. Remember that the manager and the superintendent have many other things to think about; you must make it easy for them to keep informed in regard to your work.

Summary

1. Importance of Manager's Support
   (a) Manager and superintendent must believe in safety as a business proposition.
   (b) They must give safety a dignified place in the organization.
   (c) They must let every foreman and workman know what they propose to do and what they expect him to do.
2. How to Convince the Manager
   (a) Managers do not neglect safety because they are inhuman, but because they are not informed as to its value.
   (b) To convince your manager, tell him what others have done.
   (c) Tell your manager methods used by other companies—at least one-half accomplished through organization and education.
   (d) Tell the manager you will use standards used successfully by others.
3. What the Manager and the Superintendent Can Do
   (a) Manager should call meeting of foreman and sub-foreman and outline plans for safety work.
   (b) Company must then start building guards before it can ask men to co-operate.
   (c) After guard building is started and foremen are interested, call meeting of all employes. Manager and superintendent should speak announcing plans for safety work.
   (d) Manager and superintendent must REMAIN actively interested in safety. Should receive weekly reports from Safety Engineer or Inspector.

Electric Trucks Make Saving

Many paper manufacturers are making considerable saving in their hauling problems, by using electric trucks in place of man-power trucks. Work is done faster, with less employes, and figured in dollars and cents it is the ideal way to handle supplies and finished stock in a paper mill. The illustration shows the use of one of these trucks in the plant of the White & Wyckoof Mfg. Co., at Holyoke, Massachusetts.

The Power Plant Engineer

His Joys and Sorrows

By RICHARD CLAYTON

ONE would think today that the power plant engineer in a modern paper mill, with all the latest improved equipment at his disposal, would not swap jobs with the President of the United States. He has automatic regulators for his pumps and damper, recording draft gauges, steam gauges, etc., feed water meters, filters and water softeners, and many other little conveniences which were unthought of years ago. One would think his life would be just "one sweet song." And is it is? Nix! He has his troubles; all these new and up-to-date "helps" of his must be intelligently operated and taken care of, and to do so requires study and practice, the careful selection and training of help, so that they can be a real help to him in time of need.

Not many paper mills have a surplus of power; the reverse is the rule. The mistake is usually made in the beginning when the plant is originally built for a certain tonnage. No provision being made for the expansion of the power plant, the time comes when the machine is lengthened out, or a small machine added, thereby increasing the output a few tons: This additional load not being felt much, another beater or two is added. The engineer now begins to protest, and he is given a super heater or an economizer and told to make steam. Later on it is found absolutely necessary to put in a few more rotaries or digesters. They are put in and then it is the engineer who sounds the "Macedonian cry" for help once more, and with the power plant being jammed up in the center of the plank with no room for expansion, the best and most sensible thing to do is to equip the boilers with forced draft. This being done, and assuming that by this time he has all the latest equipment together with water softeners, the chief engineer is about at the end of his resources. With the plant operating full capacity, all the boilers on the line six days a week, he has little opportunity for internal inspection and cleaning, and he can only hope that the softener is removing all the scale forming matter from the feed water, and that the furnace arches may hold up until such time as the plant may be down long enough to make necessary repairs and give everything a good cleaning and inspection.

As before stated, the mistake is usually made in the original construction plans when enough reserve space is not left for expanding the power plant. All construction engineers know that it is the correct principle to locate the power plant centrally and they make their designs on the trestleboard accordingly. They are given so much ground to work on, whereas if the owners in the beginning would specify that ample room be left for additional boilers, etc., later difficulties would be avoided.

Another thing which is not always carefully considered in the beginning and later makes life a burden to the chief engineer is the provision of some means of securing water suitable for boiler feeding. Most driven wells furnish excellent water for all other purposes in a paper mill except for the boilers, containing hard scale forming properties very difficult to overcome, in fact cannot be overcome except by expensive processes of softening and filtration, requiring, of course, extra space and equipment for these operations. A mill is fortunate if it is situated on some stream where the supply of water is reasonably soft and easily treated.

A wide difference of opinion exists as to the correct method of treating boiler feed water. Compounds of many different kinds are on the market and all are recommended and boosted by their friends. There are two distinct varieties of these; one treats the water as it goes to the boiler, while the other treats the metal surfaces of the boiler. Some of these treatments are very successful. Water softening systems are today conceded to be the most correct, reliable and efficient method of removing scale forming properties from feed water, and though the cost of installing these systems looks big, there is no doubt that the saving in coal and boiler repairs fully justifies any reasonable outlay for this purpose.

A Water Softening System

From years of experience with paper mill power plants, I would say that it is a wise provision to include a water softening system in building a new plant. The cost saving is considerable and you have started right. Many mistakes are found after a plant is completed. Some are inexpensive and easily remedied, while others cause a great deal of expense. Leaving a water softener out of the power plant plans would certainly be one of these expensive mistakes.

To get back to the power plant engineer, his joys and sorrows, I will say he is usually the best hearted sort of a man that you could find anywhere, but the nature of his duties keeps him in a bad humor a good part of his time. The supply man or the boiler compound salesman must use discretion and diplomacy in approaching him. If he happens to be acquainted with the engineer, a good friend, etc., all right; knowing his habits and disposition, he knows how to approach him, but if the salesman should be on his first

call, his chances for a hilarious welcome are slim, unless the engineer is having a good day of it with everything going smoothly.

There is much to be said about mistakes in power plant equipment, too much to be discussed in one short article: feed water alone is a subject of much discussion; the various methods of treatment, right and wrong way, etc., different types of boilers, draft, correct building of furnace arches, control and regulation of flue gases, different grades of coal, when low grade coal is most economical, and the kind of arches and grates and other furnace equipment necessary for this grade, combustion and waste in the form of ash and flue gases.

The chance for mistakes in power plant construction are many, but most of them can be overcome by a level-headed and experienced chief engineer without tearing down and rebuilding the whole plant.

Keeping Pace with New Hauling Problems in the Industry

THE day of the horse is passing in the logging camps.

The cost records of the horse compared with the records of the motor vehicle in several recent carefully checked tests, show that the use of power

equipment cuts the cost of log hauling as high as 70 per cent.

These figures were presented by practical woodsmen during the recent convention of the Woodlands Section of the American Paper and Pulp Association, who have been forced to substitute power operations for animal hauling by the far greater economy of the motor hauler.

The figures given by these operators apply equally well to lumber operations as to woods camps of the paper industry, for the hauling problem is identical in both types of cuttings.

O. L. E. Weber, of the Watab Paper Company, Sartell, Minn., told of extensive use last winter of tractors, under conditions where horses could not be used at times, but he made his comparison of costs on the basis of horse equipment on passable roads. He figured that a 10-ton tractor would do the work of 36 horses, and a 5-ton machine of 16 horses. He made his cost comparison on the basis of 5,000 cords of pulp wood, 35,000 tamarack and cedar ties, 30,000 cedar posts, and 750,000 feet of Norway pine where he actually used tractors, but where he estimated the cost of horse operation under conditions of previous years. The cost of the job with tractors was actually $3,150. The cost with horses would have been $10,100, including cost of equipment in both cases.

Stanley H. Sisson, of the Racquette River Paper Company, operating in Northern New York, told of hauling 23,000 cords of 16-foot peeled wood 10 to 12 miles, an average of 65½ cords per day per tractor, handling 15,000 cords in 38 days. His comparison with horse equipment was as follows: One team hauling 9 cords per trip, double headers at landings, costing $15.50 per day, or $1.72 per cord. The tractor cost, on a basis of 60 cords, with two trips daily to landings, was $43.06 per day, or $.717 per cord. He, like the other woods superintendents, said that care in repairs and maintenance of tractors was vital to their successful operation, and also urged care in dispatching trains of sleds or wagons, with extra equipment being loaded or unloaded while the machine was on the road.

C. L. Tolles of the Phoenix Manufacturing Com-

pany of Eau Claire, Wis., giving figures for a steam hauler, with long trains of sleighs, said that the motorized cost was only about one quarter that of horse operations.

E. A. Drott, of Drott & Newall, handling another Wisconsin logging operation said his motor hauling

cost him $1.50 per thousand feet of lumber, board measure while natives using horses were forced to pay $10, and then failed to get all their timber out. This was on a 10½ mile haul, and on a 7½ mile haul, the motor equipment cost $1 per thousand, as against $7 for horse hauls.

In these days of a virtually unanimous acceptance of the motor truck and tractor as the most efficient hauling medium in the logging industry, it takes something extraordinary in the way of individual methods to attract attention. According to reports from many of the great lumber districts, there is hardly a concern engaged in the logging business at least in some sections that have not adapted motor-truck usage in one form or another.

The development of motor hauling in this industry has undoubtedly been more sudden than that in any other field adapted to the use of trucks, and this has been the result more of a force of necessity than one of natural tendency. The reason is purely one of economy, since as soon as the timber is cut back a certain distance away from the mill or stream, hauling by teams becomes far too expensive to be practical. Logging operators, in the interests of economy, have been forced to resort to some method of shortening the distance between timber tracts and of enabling them to haul larger loads, and as soon as the motor truck and tractor were found to answer this purpose, it did not take long before their use increased by leaps and bounds.

Today, it is not unusual to learn of a logging operation which has gained substantial, or even remarkable, economies through the use of trucks.

But as far as new, unusual, and highly efficient methods of using trucks are concerned, there is hardly an instance more noteworthy than that of a logging operator at Lowell, Wash.

The length of the haul on which the truck is used is between two and three miles. At least two-thirds of the distance is over very rough country roads, and for almost a mile the truck is forced to leave the road and travel through woods.

On the trip from the mill to the timber tract, after leaving the road, the truck is hauled up a grade which, by exact measurement, is 80 per cent for a distance of about two hundred yards. Following this it is necessary to climb a second grade not so steep as the first.

The entire road through the woods is built of timbers faced off on one side and placed lengthwise. This timber road also extends up the 80-per-cent grade, due to the soft and uneven surface of the mountain's side. The truck ascends the hill empty and comes down loaded. On the way up, and in the descent, a donkey-engine and a one-and-one-eighth-inch cable are employed, the angle being so great that an elevating and lowering system are absolutely essential for safety.

The complete method of procedure by which the logs are transported from the tract to the mills may be summarized in the following manner: The empty truck and trailer unit is sent to the timber tract, which means making the ascent of the 80-per-cent grade with the aid of the donkey-engine and cable. The yarding is done with a high line and the tree used for this purpose is 150 feet high and 26 inches in diameter at the top. The logs are yarded as far as 900 feet—one donkey-engine doing the yarding and another one loading the trucks.

The truck, with its trailer, having been loaded, is then run under its own power to the top of the steep incline where the retarding power of the donkey-engine is applied and the descent made under full load. At the bottom of the hill, the truck begins its trip of about a mile through woods over the timber road—under its own power, of course. Then, after a two-mile trip over country roads, the Snohomish River is reached. The logs are dumped into the river, where they are rafted and floated to the different mills.

The operator says that he expects to handle about 7,000,000 feet of lumber in this way, and that the truck is hauling an average load of three thousand feet and making eight trips a day.

The Necessity for Proper Bearings

JESSE H. AUSTIN

JUST before the War one of the large paper manufacturers added to their staff a gentleman who was unfamiliar with the paper industry, although he had been at the head of a company in another industry. He was asked to make an examination of paper mills, which he did, and among other things reported that the large majority of mills which he visited were using old machinery which was expensive to operate, required frequent renewals, was allowed to run until the rolls could hardly be kept in alignment, and that it was almost impossible to make a uniform product or duplicate a particular grade or sample of paper from the same mill or some other mill. The methods were so at variance with his ideas and the practice in his former industry that he gave careful consideration and study to the methods of paper machinery. As a result his company decided to change their methods and manufacture paper scientifically—discarding the old "rule of thumb" methods, and adopting processes based on results of scientific research.

As far as I know, this was the beginning of new

progressive methods which have and are being taken up by the paper manufacturers. They seemed to have awakened to the fact that the process of manufacture can be reduced to theoretical and practical rules as in some other industries. Now, many large paper mills have established technical departments in charge of expert chemical or mechanical engineers, who decide methods of manufacture from a combination of their technical and practical experience. They are getting away from the idea that no one can manufacture paper, except Tom Jones and his sons. That it is possible to so educate workmen and prescribe methods which will not only produce a better paper, but will, at the same time, increase the production of present day machinery.

The reason back of this progressive movement we believe to be the demand for quality. From childhood we have been taught that whatever is worth doing at all, is worth doing well. We send our children to school and college for the purpose of teaching them to achieve a little better than our neighbors' children and we look, with pride, upon their successes. We can well imagine the feelings of parents at the achievements, for example, of Morse Bell, Westinghouse, Whitney, Guttenberg, Bessemer, Goodyear and hundreds of others we might mention. They invented superior processes or machinery which increased production. They achieved a little better than their associates.

Since the War, we have all been demanding quality in labor, quality in output, quality in machinery. Labor has been equal to demand and has grasped the idea and tried to do their part, but many mills seemed to forget the necessity of co-operating with labor and giving them quality in material and in machinery with which to work. To obtain quality in completed materials or machines, the units entering into their manufacture must necessarily also be of quality.

Paper mills when purchasing machinery must demand that quality units enter into such machines. The manufacturer of such machines must insist that his machine tools be equipped with quality units, lathe, planer, shaper, drill press, milling machine, etc. The principle is just the same as when we go to the tailor to order a suit of clothes. We demand quality in material and workmanship. If we purchase a pair of shoes we likewise demand quality. We are none of us satisfied with the service obtained from cheap material in wearing apparel, and we are quite inclined to patronize only the shops which handle quality goods and one grade, the best.

In our business, if we ease up a bit, we soon find our "star" gradually falling and it often requires hard knocks to awaken and start us again on the right way. The principle of building permanently, on the rocks—not on the sand—is so old that we often wonder at our own mistakes. Build accurately—build permanently—build quality.

The majority of the machines used in the manufacture of paper are rugged and substantial in order to successfully withstand the heavy and severe service to which they are subjected. The work demanded by such machines is strenuous. You require the Jordan, the Fourdrinier, the beaters, the paper making machine, to run continuously at maximum capacity and, of course, to perform such service you demand quality in the machine. Because the service is so heavy, up-to-date manufacturers have figured the amount of saving if, for example, they can reduce the friction horse power required to operate the machinery. They estimate that unless they can save horse power and be assured of continuous operation, their operating expenses climb so rapidly that the cost of their product is likely to put them out of competition.

The demand for quality, generally, must come from the user of the machinery, as the machine manufacturer may be content to make the same machines he has been producing for the last twenty years. Of course, when the demand for quality comes sufficiently strong, all machine manufacturers are ready to fall in line, with consequent keen competition; but the progressive machine maker keeps just a little in advance of his competitor, builds a little better, anticipates the demand for quality and thereby "gets the jump" on competition.

We all know that large saving in friction horse power is made by the application of anti-friction bearings, and the problem usually simmers down to whether we shall use a ball or a roller bearing. Of course engineers recognize that nearly every anti-friction bearing has its particular field. There are some classes of work where the load is so light that the cheapest kind of a ball bearing will be adequate, but the service required of the machinery used in the manufacture of pulp and paper is so severe, demanding continuous operation and reduction in friction horse power, that only the best bearing has been found to perform satisfactorily. We find many mills still operating machinery equipped with bronze and babbitted bearings which are continually wearing out, causing a variation in the products as well as annoyance and expense in replacing bearings. One manufacturer states that it costs them $10.00 per minute to stop the paper making machine to replace bearings. The lubrication of these plain bearings also is an annoying problem and this is not alone confined to the paper industry. It is stated that there seems to be a general complaint that the majority of machine idleness is due to the lack of proper lubrication; that one remedy has been to provide more positive methods of lubrication; another has been to assign the lubrication of machines to men charged with a specific duty. These are makeshifts, however, and have not achieved the desired result, that is, decrease in friction horse power, continuous operation and increased production. To quote from an address of

Mr. T. E. Dial, on the lubrication of pulp and paper making machinery at the Convention of the Superintendents of Pulp and Paper Mills at Chicago, in November, 1920—"You will notice today that we have on our chart, which accompanies the program, a record breaking speed for the production of paper—1,000 feet per minute. We have on that machine, ball bearings and roller bearings. I ask you, why they digressed from the use of the old plain bearings to the ball bearings? You will tell me why that is easy. We wanted to reduce our power for operating that machine. We wanted to make it possible to increase the speed of that machine to turn out a greater amount of product and a better product."

To quote from a catalogue of ball bearings, "A stone boat, has a broad bearing surface and high friction loss. Mount the same load on wheels (rolls) and we decrease the area at the point of contact of the wheels with the rolls and greatly increase the unit surface pressure; but the traction efficiency is also greatly increased." What would be the effect if the heavily loaded stone boat was mounted on four balls instead of four wheels? A short roll with length equal to its diameter will carry a static load ten times greater than a ball of the same diameter and same material.

Many different designs of ball and roller bearings have been applied to the machinery of paper mills. Correct design in roller bearings is a fundamental principle. Instead of using long rolls, which cannot be ground truly cylindrical, **short rolls** are recommended, staggered and meshed so as to produce a uniform distribution of load on each roll throughout its entire length. These rolls should almost completely cover the inner and outer races, the small space between the rolls acting as oil reservoirs and the lubricant being distributed over the surfaces of rolls and races by the rotation of the rolls.

The short rolls do not warp, break or chew out the ends of cage rings and pins.

Material

Many roller bearings are made of low carbon steel, case hardened. As you know, such material will wear excessively and unless the bearings are adjusted from time to time, the machine runs out of true and imperfections in the product result. If ball or roller bearings have to be adjusted from time to time, it means that unless an expert has charge of such adjusting, the condition resultant therefrom is the same as above stated. The ideal condition is reached in a bearing which does not require adjustment. The highest grade of material known for anti-friction bearings is high carbon high chrome alloy steel. After heat treatment, this steel is of the same quality throughout, from the center to the outside, heat treated all the way through. This is in contradistinction to the case hardened work, which merely has a hard skin around the outside, backed up in the center by low carbon soft steel, and has not been able to stand the shocks and severe service of paper making machinery.

Workmanship

The rolls and races of a good roller bearing should be properly heat treated so as to obtain a glass hardness throughout. They should then be finished to precision measurement. The result will be a bearing which will carry the greatest loads and sustain the greatest shocks.

From the Wall Street Journal of June 24, 1921—"When business is slow, prepare for a boom, when things look dark and gloomy, it is always dangerous to say that a thing cannot be done. Whether a thing can be done is usually contingent upon the willingness to do it." Now is the time for the paper industry to take the same action as many other manufacturers today, that is, "Put the house and machinery in order" so that when the boom comes, you are prepared to increase your production with a decrease in cost.

Property Protection for Paper Mills

BY F. M. MORRISON

THE nature of the paper industry imposes upon paper mill property more than the ordinary hazards incident to the operation of the average industrial plant. Fire, both of incendiary and natural origin, is a constant menace. Thefts of raw materials, semi-finished and finished products, constitute both a source of annoyance and heavy monetary loss.

For some time past, we have made it our business to pay some attention to the means various paper manufacturers have adopted to combat these evils. In most instances, it is evident that mill owners place great reliance in adequate fencing first. This fencing is of the heavy steel chain link mesh variety, about seven feet high, with overhanging arms supporting barb wires.

To be sure, fencing will not prevent fires occurring from spontaneous combustion or accidents, but it will cut down the chances of fires resulting from incendiarism, also the carelessness and irresponsibility of smokers who in the past have been in the habit of frequenting at will the yards and property of paper mills. To render paper mill property free from this menace, trespassing must be stopped, fire-bugs and strangers must be barred, and the latitude of smokers restricted to areas where proper precautions

against fire have been taken. It goes without saying that where fencing of the type mentioned is installed, thieves and others who would enter mill property for vicious purposes meet a determined and effective barrier.

Furthermore, fencing affords ideal protection to property during industrial misunderstandings. Unfortunately, in times past, the property of many concerns has suffered extensive damage at the hands of vandals when a reliable fence would have prevented such destruction; would have prevented an expensive shut down and would have saved thousands of dollars which were necessary for repairs to buildings.

Then again, it is a proved fact that an element of humanity, altogether too large for our national welfare, harbors an instinctive grudge against all progress. These people vent their feelings usually through acts of vandalism and wanton destruction of industrial property. As a rule these high handed vandals strike where access to property is easy. This form of destruction exacts a tremendous toll from American manufacturers each year and fencing will go a long way to curb the activities of these lawless characters.

Protection against thefts and destruction of paper mill property is not the only benefit to be derived from fence protection. The inauguration of a system governing the coming and going of employes as well as outsiders is an innovation worthy of note.

With fencing surrounding mill property, all persons can be compelled to qualify for admittance to,

Property of the Marathon Paper Mills, Rothschild, Wis.

as well as exit from, grounds. Centralized gateways can be located at convenient and strategical points where those who enter and leave factory premises can be observed. This discourages petty thefts and makes it possible for the factory owner to discriminate against undesirables who would gain entrance to his premises.

It may also be said that fencing provides for the efficient and economical use of the entire mill premises. Storage of raw and finished materials can be accomplished with greater utility and safety. The entire mill yard up to the property line can be occupied—a fact, which when compared with the investment in real estate, means a worth while reduction in the overhead carried.

Reduction in the expense for watchmen where fence is installed is another benefit that will appeal to all paper manufacturers. We have it on reliable authority that a well known automobile concern re-

Property of the Chester Paper Co., Chester, Del.

duced their force of watchmen from twenty to only one who, with the assistance of the fence, was able to render a greater degree of efficiency than that afforded by the entire twenty without fence protection. It is easy to compute the annual savings accomplished in this instance and to realize that the saving paid for the fence during the first year.

Don't take chances. Keep outsiders out. If your mill is not fenced, give the matter of fencing your thoughtful consideration. Outsiders have no business on your premises or in your mill, either during or after working hours. Their presence on your property is a dangerous nuisance that is costing you untold losses each year, causing lost time among your workmen, damage to property and incurring other losses through disturbing the efficiency of your plant.

The Only Way

If you toot your little tooter
And lay away your horn,
Within a week there's not a soul
Will know that you were born.

The man who tries to advertise
By short and sudden jerks,
Is the man who's always kicking
Because it never works.

The fellow who is on the job
A-humpin' every day,
And keeps forever at it,
He's the one who makes it pay.

—Hubbell's Individuality

BELOIT IRON WORKS

Celebrates 63rd Anniversary by starting up Highest Speed News Machine at Consolidated Water Power & Paper Company Wisconsin Rapids, Wisconsin

First attempt successful in taking sheet through to winder, making perfect rolls which were shipped to publisher.

Starting up speed 740 feet per minute and running safely and continuously without a break for two and one-half hours.

IMPARTIAL JUDGEMENT UNSOLICITED

MR. WM. C. NASH,
Neenah, Wis.

Writes as follows:

"I assure you that I had more than my money's worth in looking over your efficient and up-to-date plant and the wonderful work accomplished in perfecting the most complete paper machine in the world.

"I want to tell you how I have felt after watching your demonstration. It seemed to me that I had lived to a ripe old age and I have prophesied and heard others do the same that some day there would be a machine built that **wire could be slipped on without taking out a roll,** but never dreamt that anyone would tackle such a costly proposition in this generation. You are to be congratulated, you have something to be proud of, as **I believe a wire can be put on while washing the felts, forty minutes will do the trick, no danger crimping the wire or buckling the rolls and many other good points too numerous to mention."**

A well known expert paper maker said he "had been present at the starting of all recent High Speed Machines **but never saw one** run so perfectly and make shipping rolls first 'crack out of the box.' Felts and wires running perfectly. guides having no work to do and draws perfect, every bearing cool."

MR. G. W. THOM,
Appleton, Wis.

Writes as follows:

"I well remember when a boy of often having raced to the fire engine house, on hearing the alarm sounded, to watch how quickly the harness could be applied to the horses.

"I had been told when a night alarm was sounded, that fire fighters, should they be sleeping, were aroused and would simply jump into their clothing, which was all hanging in the proper position for so doing, and rush to the fire.

"The first time I ever saw the feat performed of jumping into clothing and being ready for duty was at the Beloit Iron Works on Thursday when **you easily demonstrated** how a **Fourdrinier, as a unit, can be "jumped" into the wire and ready for duty in a few minutes.**

"You certainly have an ideal arrangement and entirely different from any previous arrangement, such as has been on the market.

"The Fourdrinier, as you now build it, is the best on the market.

"We are so much interested in this Fourdrinier that our General Manager has requested me to give him an estimate on adding a **new Fourdrinier of your latest type to our number four machine."**

Beloit Iron Works, BELOIT, WISCONSIN

Builders of Highest Speed Paper Making Machines

Preparation of Cost Figures for Administrative Control

By HAROLD DUDLEY GREELEY, C. P. A.
Treasurer and Director of Publications of National Association of Cost Accountants

WHAT is needed at the head of the cost department in a manufacturing plant is an accountant and not a bookkeeper, and this raises the important question of the difference between them. Ten or fifteen years ago it was a standing joke that an accountant was a bookkeeper out of a job; but since that time the qualifications for accountancy have become fairly well established, and it is possible, in a general way, to indicate the kind of work which an accountant should do.

Before touching upon these technical qualifications, it may be well to point out that the cost accountant in a plant resembles somewhat an airplane scout. The scout has the duty of reporting immediately any indications of danger or any chances of advantage which he may observe. If he fails to report merely because he has not been requested to, he has failed in his mission. It is obvious that his commanding officer cannot order him to report on specific things about which the officer knows nothing. It is the duty of the scout to discover things and report them. In the same way, the cost accountant at a plant must scout around and discover through his figures, his reports, and by his general observation, any tendencies towards waste and any opportunities for efficiency. In a general way, the man who has the qualifications of an accountant plus, of course, some knowledge of engineering, and a thorough acquaintance with the workings and problems of his particular plant, is better qualified to do this kind of scouting work than a man who has been limited by the somewhat narrow experience of bookkeeping.

In referring to accountants, I do not mean at all to confine that term to men in public practice. Just as there are engineers in private employ but who are, nevertheless, fully qualified members of that profession, so there are accountants acting as auditors, comptrollers and cost accountants in private plants, who are thoroughly trained in the profession of accountancy.

An accountant has three main functions to fulfill. He must record, present and verify financial transactions. His work in recording is not that of the bookkeeper who daily records in accordance with an established system the routine transactions. The accountant, so far as his work of recording is concerned, is called upon to make the record of exceedingly complicated transactions where the rights of all the parties involved may not be correctly observed in an adequate book entry. Sometimes the preparation of such an entry requires the highest type of analytical mind. The accountant in his recording function must also lay out systems of record for the effective recording of future transactions at a minimum clerical cost. In his work of presenting figures the accountant must be able to utilize all known forms of statements and to design original forms when it is necessary to emphasize some particular phase of the business shown by the figures. In presenting he must also be a diplomat. The cost accountant who presents statements apologetically and who is afraid to defend his figures when he knows that they are sound, cannot fulfill properly the functions of a cost man at a plant. In the matter of verification the cost accountant at a plant has a tremendous advantage over the auditor in public practice, because of his familiarity with all of the details of the business and because of the unlimited time at his disposal. A bookkeeper could not, of course, verify his own work to any appreciable extent, and he is generally so busy with his routine labors that he has not the time to verify the work of others even if he had the necessary training. An adequate verification is absolutely essential because no amount of analysis or artistic statement preparation will avail if the original entries upon which the figures are based are erroneous.

Knowledge of Economics

To qualify a man as a cost accountant he should have a general appreciation of the fundamental principles known as economics, which govern the general relations of man to man. He should know, for example, something about prices, panics, finance, taxation, and the workings of the well-known law of demand and supply. He should have a sound knowledge of business law. He should have a complete and exact knowledge of all methods of account keeping, statement preparation and methods of auditing. Only with such a training can a man hope to be able to prepare significant figures in intelligible form for use in administrative control.

The general question of the preparation of cost figures for administrative control falls into two groups, of which the first is the matter of personnel about which I have briefly spoken. The second concerns the form or technique of statement preparation. The underlying principle there is to present figures with completed ideas supported by detailed schedules. A report should present at its very beginning a summary of all the matter that follows, so

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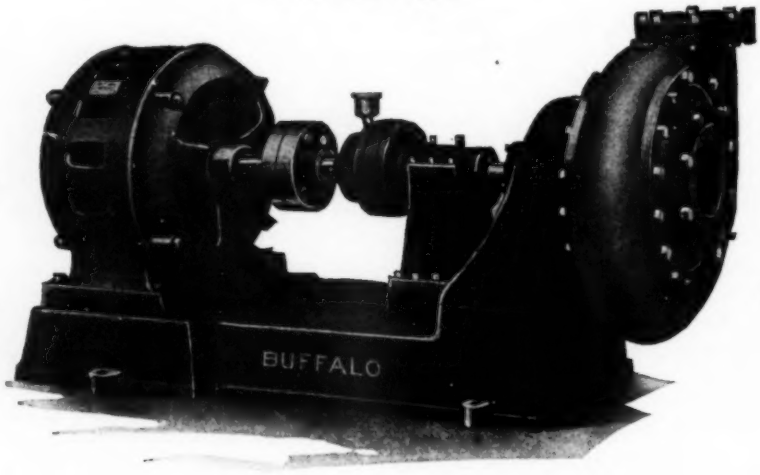

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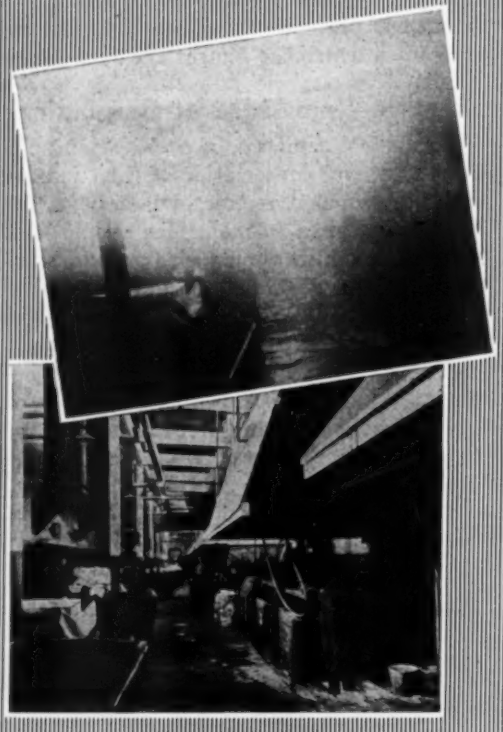

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BUFFALO, N. Y.

"Buffalo"

that a busy executive can get the gist of it without laborious reading. On the other hand, the conclusions presented in the summary should be sustained by detailed schedules, so the executive, if so included, can check up or verify the conclusions drawn. Reports must, of course, be presented promptly because what the executive wants is news and not history.

The methods of graphic presentation should be carefully considered in every plant. In order to be of use, however, graphic statements should be prepared by a man who understands the science and underlying graphics. The use of a circle divided into segments instead of a series of horizontal bars, or the use of squares of different sizes instead of a plotted curve, may under certain circumstances, render the statistical statement not only of no use but absolutely misleading.

We all know of plants where the cost system has been abandoned and the cost department abolished because no usable information worth the expense of securing it was produced by the department. It is believed that in most of those cases investigation will show that the fault lay at the door of the head of the cost department because of his failure to realize the possibilities for usefulness in his position. We cannot expect to secure intelligent analysis of operating results and other financial facts, unless we employ an accountant with the necessary training to qualify him for his work of recording, presenting and verifying financial transactions for administrative control.

Prolonging the Life of Our Forests

By E. R. SPIEGELBERG

OF the various fundamental details pertaining to economy in the manufacture of paper and pulp, one of the most serious and neglected items in the paper industry pertains to the waste of our forests, due principally to competition in the buying of pulpwood, and also as a result of selfish interests involved among mill managers.

In relation to the peculiar local conditions oftentimes existing at mills located in various parts of the country at the present time, there is a sinful and uncalled for waste of timber due to the fact that the specifications of cutting and purchasing of pulpwood are more on an extensive rather than on an intensive plan.

I have in mind particularly the fact that most of the pulpwood is bought in four or eight foot lengths, and it has been my experience, having been brought up in a timbered country all my life, to know that with a large majority of the trees that are cut to comply with these specifications, that invariably there would be a sufficient amount left of the top of the tree to make a first class stick of pulpwood had the specifications been liberal enough to allow two foot lengths of pulpwood to be shipped, and from my observation and experience, I claim that there would be at least fifteen percent more pulpwood secured from an acre than at present, if wood was allowed to be shipped in two foot lengths, etc.

It is a generally accepted fact that in buying wood cut in two foot lengths instead of four or eight foot, you get ten per cent more of pulp from a cord of one hundred twenty-eight cubic feet and you also get a better grade of wood because the defects appearing in a tree are eliminated to a greater extent.

Because we must sooner or later come to these requirements, there is no reason why immediate action should not be taken and thereby benefit in the meantime.

Furthermore, all mills should be compelled to accept wood down to three inches in diameter which would give another increased percentage in the yield of wood from an acre, which percentage would be similar to the one above mentioned.

This, of course, should not apply in reforestation but only where the logger or settler is cutting off all the timber in view of eventually clearing the land for agricultural purposes.

In most all of the communities where virgin forests formerly existed in the vicinity of paper and pulp mills, there has grown up a stand of second growth poplar which is of little value to the owner of the same and which can generally be bought at a lower price per cord than most any other timber growing.

The same partly holds true of Jack Pine and balsam, and, whereas the paper industry has been adapting itself, in recent years, more to balsam than most any other kind of wood, they are sadly neglecting the opportunity held forth in the poplar and Jack Pine.

It is a fact that a first class sheet of News paper can now be made without the use of spruce, but with hemlock sulphite, pine, poplar and balsam groundwood, and, because this proves practical and economical, I claim that spruce should be conserved for the higher grades of paper and not wasted on the so-called "News" and similar grades.

No doubt, legislation will have to be enacted before this is made customary, for the reason that the large mills, with very fast running machines would be handicapped in production, because they cannot run the machines so fast if not using spruce ground-

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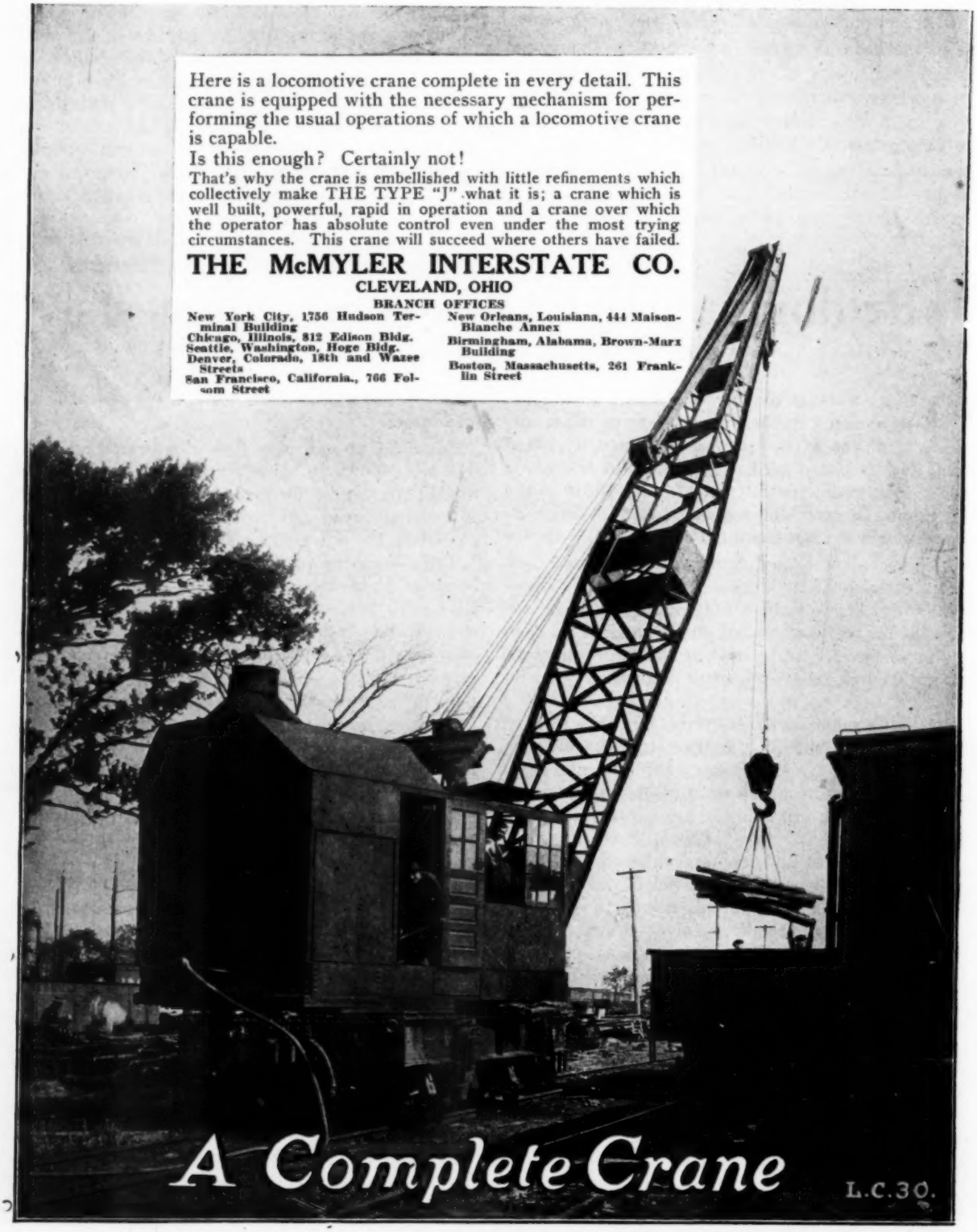
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wood and their cost would naturally increase, but in the long run the slight extra cost would readily be more than offset in the lower priced furnish of these cheaper woods. Naturally, the large mills would lobby intensively against such legislation, but to carry out such a requirement it would bolster up and help the small mills who deserve the necessary help and which are now handicapped at the present time in competing against the fast machines, and would tend to stabilize the News product.

In fact, all of the above recommendations should be handled through legislation, and the states or Federal Government should also take part in the saving of the waste coming from a mill by having inspectors determine whether the mill is thoroughly and efficiently equipped with save alls and a similar class of machinery for the saving of waste.

At a convention, a few years ago, in one of the Eastern cities in which there were about one hundred paper mill managers in attendance, it was brought out that there were three classes of managers at that meeting. One class did not know their percentage of shrinkage, the other knew and were ashamed to state how much it amounted to, and the third class did know but were secretive about announcing how low it was. It developed that there was an extravagant and sinful waste in that particular department of the industry.

I feel absolutely safe in claiming that such legislative action would show a larger indirect saving to raw material than that of the cutting of timber above referred to.

Manufacture of Box Board in England

BY W. H. SYLVESTER

THE Cylinder Mould Machine is not so well known as the Fourdrinier. No doubt you are all well acquainted with the Fourdrinier Machine, so it is not necessary for me to dwell on it, except I may first refer to it in the course of my paper.

In the manufacture of box boards many materials are used, as in the manufacture of some grades of papers, including chemical, mechanical and soda wood pulps, also various grades of waste papers. Waste papers are prepared in a rotary boiler with sufficient water added to soften them under a pressure of about 10 lbs. of steam. Some mills use pulpers in place of the rotary boiler. Of course, it is a matter of opinion as to which method is the best—the pulper or the rotary boiler; for common mixed papers, I have always found the rotary boiler best.

The papers, after passing through the rotary boiler or pulper, are furnished into the beaters in the usual way, but in some mills there is a system of continuous beating. In this system the papers are delivered by a conveyor into the beater which has an outlet near the top through which the stuff flows on to a wet machine, which consists of strainers with a wide cut and fitted with scrapers. After passing through the strainers, the stuff is run over the wet machine, which consists of a cylinder mould and a felt. It is then reduced in density and passed through the Jordan into the machine chest—thus a very effective and economical method of dealing with common mixed paper for boxboards.

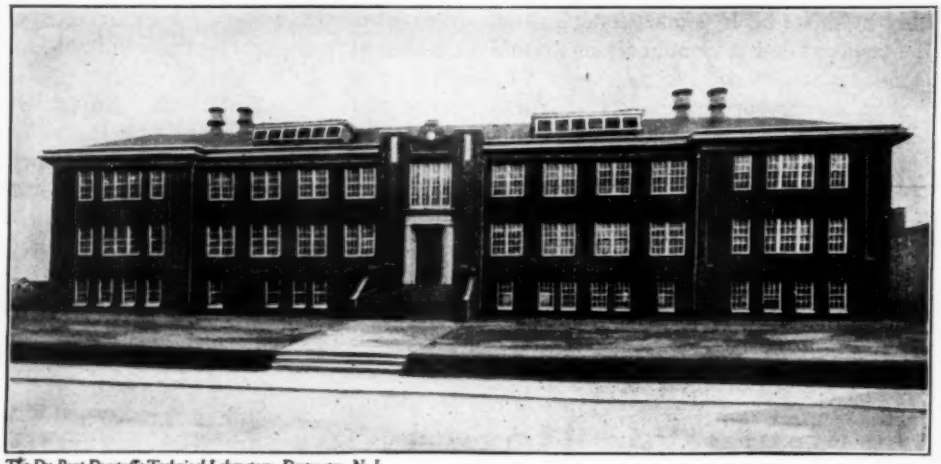
In making a triplex or filled board, very often the middles or fillers are composed of different stocks; for instance, it may be mixed papers or news or mechanical wood. The face and back or outside liners may be composed of sulphate and mechanical wood or any other suitable furnish according to the class of board required, or the middles, backs and linings may be composed of three different kinds of stock. When this is the case one of the many difficulties, which often occur incidentally to box board making, is encountered; namely, if the three different kinds of stock which are all run on the machine at one time are not prepared so as to have an affinity to each other, you will have a board that will easily split apart.

Now to obtain the required affinity of the three kinds of stock, great care must be exercised in the handling of the stocks in the beaters and Jordans, for if the middles should be too free or fast and the backs or liners too slow or wet, you will have a splitting board. This rule applies to all the various kinds of stocks which are used in the production of triplex boards.

The Multi-Cylinder Machine

My experience has proved to me that a Multi-Cylinder Mould Machine is much more different to run than a Fourdrinier. Take, for instance, a 5-vat machine. You have five suctions to regulate with three different kinds of stock and there is, as may be expected, always a little difference between each kind. Now just to point out this one difference between the Cylinder Mould Machine and the Fourdrinier—should the stuff become a little slow or wet on a Fourdrinier, you would put a little more suction at the boxes, whereas in the Cylinder Mould Machine you would reduce the suction; if you did not do so, the vat would become clogged owing to the fact that the mould would not pick up; it would also set up crushing at the coucher.

I would also point out that you have not so much control over the stuff as the amount of suction is



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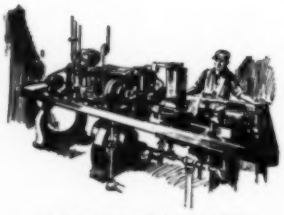

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very limited on a Cylinder Mould Machine. There is one couch roll to each mould. The couch rolls have to be very much more resilient than for paper making. The best kinds of couchers I have used for boxboard-making are homemade ones of the Hoffman style.

Cylinder Moulds

Cylinder Moulds are best spirally wound. This is a much better method than perforated plates. The shaft running through the mould should be of about 6" diameter and hollow, as this gives more rigidity to the mould and prevents creeping of the backing and face wires. Back and Face Wires should be fastened to the Mould with a ring and screws at the end, on the same principle as the covering is fastened on a dandy roll.

Baby Presses

Some machines have five or more baby presses and a major press through which the board passes between the top and bottom felts. To give some idea of the size of wet felts at top and bottom some of these wet felts are nearly 2,000 square feet. After passing through the baby presses there are two, and sometimes three, main presses before the board arrives at the drying cylinder. All the bottom presses are of rubber. These often require grinding and should be cambered according to the width of the machine. The grinding of the rubber rolls are often done without removing them from the machine. The grinding of the rubber rolls are often done without removing them from the machine. The major baby press, also the main presses are geared. When the bottom roll has been reduced by grinding to a certain point, it being geared, it will what is termed "slip". This can be remedied by adjusting the gear wheels to suit the circumstances. Of course the method is well known to the engineers.

Drying Cylinders

Great care must be taken in drying multiply box boards, as in drying paper. In drying box boards, should the first section of drying cylinders be too hot you will have blistering on the surface, owing to the fact that the outside would be too hard to allow the steam from the middle to evaporate.

Cutters and Winders

Cutters, which should be of the duplex type, are attached to the end of the machine, as also are the slitters and reeler. In the case of sheets they are cut, sorted, counted and tied up at the end of the machine. The slitting and mending is also done before the board leaves the machine. There are two winding drums between the calender and cutter on which the board is run before being passed through the reeler. While one is filling, the other is being reeled off.

The reeler runs much faster than the machine makes in order to allow time for taking out the reels. The reeler, or winder, should be of the type fitted with differential gears which allow various diameters of rolls to run off at one time; for instance, say there may be three reel bars; you may have different size centres on each bar, but they will all wind up tight in this type of winder, or reeler. Should one reel break it will stop all the others. The slitter knives are driven by the roll of the board from the winder.

I have not gone into the various types of drives which are used on boxboard machines as this is in the province of the engineer. But in conclusion I beg to say I was first a papermaker then a boxboard-maker but was never an engineer or chemist. I am not very conversant with engineering or chemical symbols, such as H O H, H, but the most applicable and also most useful letters between the engineer, chemist and practical paper man are I. O. U. for I mention the chemist, the engineer and the practical papermaker all owe something to each other in the successful running of a paper mill or box board mill.

Making Cleaner Paper

By EARL DEWEY

THE manufacturers spend thousands of dollars a year in trying to produce a clean sheet of paper. We know that paper which is not sold for "firsts" has to be sold for "seconds" or "thirds" or has to be milled over again, meaning the loss of labor, and many other things. In order to illustrate what I intend to show, I will ask the reader to walk with me through the mill to get acquainted and try and locate some of the paper makers difficulties.

We will start from the bale of rags. A bale of rags has to be loosened, so they are run through a machine which is called a spreader. They are then taken to remove all buttons, hooks, eyes, etc., and the seams that are in the rags must be opened to loosen the dirt that might be in them. When this is done they are sorted and put in piles according to their value. They are next run through a set of knives which cuts them into small pieces, from which they are put through a large screen that is called a duster to remove whatever dirt is left in them, and then cooked to remove all oil and grease.

The rags are then washed and bleached, and dropped into large vats or what paper makers call drainers, to drain out the liquors and gases that are used in cooking and bleaching. They are then ready for the beating engines, where there is a large roll of bars that cuts these rags into small, fuzzy fibres. After a length of time, we let these fibres down into a

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Paper Mill Machinery

chest, from where, if we do not have a jordan, they are pumped up to a box called a stuff-box where they are mixed with water and then run along into a box called a sand-catcher and into a screen that lets it flow onto a wire cloth where it is formed into a thin layer. It is squeezed and run on felts to get whatever water which could not be gotten from it when on the wire and then run over large cylinders filled with steam to further dry it.

We now have a sheet of paper. In going along no mention was made of the use of wood nor of the various chemicals used to give durability, color, sizing, etc., as there are so many ways that these are used and I would be drifting from my subject.

Now that we have a sheet of paper, let us try to find where the dirt is coming from. Starting at the washing engine, we know there is a large roll that draws the rags out into long fibres. This roll has a good many steel-bars and is continuously revolving in water. In this washing engine there is a device called a button catcher that catches hooks, pins, buttons, etc. that might have gotten in by the sorting. If this button catcher is not clean, the buttons, etc. will break away with the result that they will get into the stock, go through the mill and make a lot of waste. When the stock is washed and bleached, we are ready to let it down into the drainers. Did you notice the floor of your drainer and the side walls? Was it fit to let down the clean white stock?

If we are ready to furnish our beating engine, we must get the stock up. If you are digging stock, are you walking on it with dirty shoes? Did you notice the condition of your stock car; is it fit to put nice, white stock into? If you do not notice these how can you expect to make clean paper? And they say it's in the stock.

We are now ready to furnish the beater engine, where there is a large roll with bars that is continuously revolving in water. Water eats away iron. How often do you scrape these bars on this roll? The water is eating the bars on this roll, and the result is that rust and metal is breaking away and showing up in your paper.

Twenty percent of your dirt is coal-dust. Where is it coming from; is it from the chimney in your boiler house? It can't get into your stock if you keep the windows down.

We can not make paper without water; can we? We know that water runs a long way and that after a while will rot a stone away. Then if little specks break away from the stone and it gets through the filters, what would stop it from getting into your stock? The water that is used on your beaters, washers and machine is usually filtered, and in a good many mills that I have worked in, the water-pipes overflow. Water-bags should be placed to catch the rust and dirt that comes through. Supposing that these bags fill up and they break open; what becomes of the sediment that was in the bag? Many a man watches his work, but this happens to the best of them; I know from experience. A good idea is to attach a sand-box to each pipe; they pay for themselves in a short while.

We will now get our stuff into the chest. How are the joints of the chest; are they rough? Has slime started to accumulate? How is the seat of your stuff pumps; are they slimy? How are the pipes that the stuff runs through? Right here may be the cause of some of your weight trouble. If the ball does not fit the seat in your stock pump and the seat is slimy, variations can be expected in weights, because your pump is not giving results and will cause lumps and strings to gather. This is only a suggestion from experience; there are many ways to cause variations in weight. To get back to bit, how long are the pipes from your chest to your machine? I believe that all pipes should be as short as possible and put up so that they can be taken down in short notice.

We will go to the stuff-gate now and let the stuff run through the sand-catcher. Some men believe in a short sand-catcher. If you run the stuff through a long sand-catcher, it will make it slow. If the bottom of your sand-catcher has a nice, long nappy felt on the floor, and you have it arranged so your stuff has an up and down flow, it gives the dirt a chance to strike this nappy felt and cling to it.

Rust and metal are other things to be considered. A good many paper machines today have metal-catchers. I believe a good place to have this is just before it strikes the screen, because you are running the stuff through a long sand trap, and you have it arranged to give that up and down flow. The long nappy felt is getting the most of it, so that the metal catcher will not have to do much work—and I think you can get better results.

We are now ready to run our stuff over the wire. Beneath the wire is a box called a save-all which catches everything that comes from the wire. If the save-alls are made so the men can not wash them out, the slime that accumulates breaks away with different speeds of the machine.

How about the wet-broke at your press rolls? Are you throwing broke into a car that you use around your washing engines? Are there fifty kinds of colors in it? All these little things go to show how easy it is to make dirt. If men would spend a little more time and watch these little things in different departments, it would mean a great deal to the manufacturers, and to the men themselves.

With all my experience, I have never run across a man that did not want to give results in a paper mill. I think if men were given time and force of water, etc., the manufacturers would save in their finishing room thousands of dollars a year. The employes can not do everything; it is up to the management of a mill to have a system.

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THAT'S exactly what the American-Larson Suction Ventilator will do. Because of its greater exhaust capacity *one* American-Larson will exhaust as much air as two average ventilators of the same size. This means that you can get the same result at *half* the cost for apparatus; *half* the cost for transportation and installation.

The *reasons* back of the increased capacity of the American-Larson are found in the *distinct differences* in its construction.

The American-Larson is the *only* suction ventilator which applies the siphon principle in a logical way. Instead of following the sharp angle of 90° or less, the line of exhaust is *above* the horizontal. Discharged air has easy upward course. Resistance and friction are overcome. Suction force of outside air is unobstructed.

The American-Larson is the *only* ventilator that is as wide at "mouth" as it is at the "throat."

It is distinctive in having nothing whatever to hinder its discharge. No "shutters" etc. are required.

It stands *alone* in presenting the suction tube *directly* to the air current. It is kept in strict alignment with the slightest variation of the breeze by means of a vane, fastened to the top of the cowl.

Furthermore, the American-Larson involves no operating or upkeep costs whatever—it operates *itself*, effectively and dependably from one year's end to the next, without attention or adjustment.

On the basis of efficiency *plus* economy you owe it to yourself to thoroughly investigate the American-Larson.

Write Dept. G for Catalog giving complete details.

The American Ventilating Company

Martin Bldg. Pittsburgh, Pa.

AMERICAN LARSON SUCTION VENTILATORS

Consolidated's Big Paper Machine

THE new mammoth paper machine of the Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., is now operating steady and making newsprint at the rate of 725 feet per minute, after having started on July 5th and continuing at this most remarkable and unheard of trial speed.

This wonder of the age was designed and built by the Beloit Iron Works of Beloit, Wisconsin, to operate at a speed of 1200 feet per minute. Although it has not yet attained this mark, one needs only to witness the ease and apparent slowness with which the machine is now running to be convinced of the possibilities of this veritable giant.

Photo Courtesy of Wisconsin Rapids Tribune

The big paper-making machine from calender stack

Its striking engineering developments and refinement of design will, without a doubt, enable the machine to produce all that is expected of it when all the different contributing sources have been coordinated to make it possible.

At the expected 1200 feet, the machine will produce every operating day of 24 hours, paper 327 miles long and 12 feet, 2 inches wide, or in terms of weight, 110 tons daily, amounting to 34,400 tons annually. If the annual output were cut into two 6 foot strips and placed end to end, it would entirely encircle the globe.

During a single day's operation, more than 100,000 tons of water will go on the machine. One hundred cords of wood will supply the pulp, and 110 tons of coal will be required daily to generate steam to dry the paper. The actual weight of the machine is 1320 tons. It is 325 feet in length and its various parts are of unusual size and dimensions.

Description of the Machine

The paper machine consists of one breast roll, top and bottom couch rolls, five presses, thirty-eight six foot dryers, two five foot felt dryers, one twenty-eight inch receiving dryer, one ten roll calender stack, one Pope Patented reel, one winder.

The breast roll is 24 in. in diameter and has a 162 in. face, and is supported on ball bearings. The bottom couch roll is 26 in. in diameter and has a 162 in. face, supported by ring oil water cooled boxes. The Fourdrinier wire is 160 in. wide and 100 ft. long. All of the table rolls are 6 in. in diameter and are supported on ball bearings. There are six oscillating suction boxes. The deckle straps are 2¼x3½ in. square. The pitch of the wire from the breast roll to the couch is 3 ft. The height of the slice is 40 inches.

Several Improvements

An engineering feature that is an entirely new development in the design of paper-making machines has been accomplished in the manufacture of the Fourdrinier section. The entire operating part of the section lifts from its bed, and

FOURDRINIER WIRES

Dandy Rolls *Cylinder Molds*

Brass, Copper and Iron Cloth

Bank and Office Railings

WIRE SIGNS

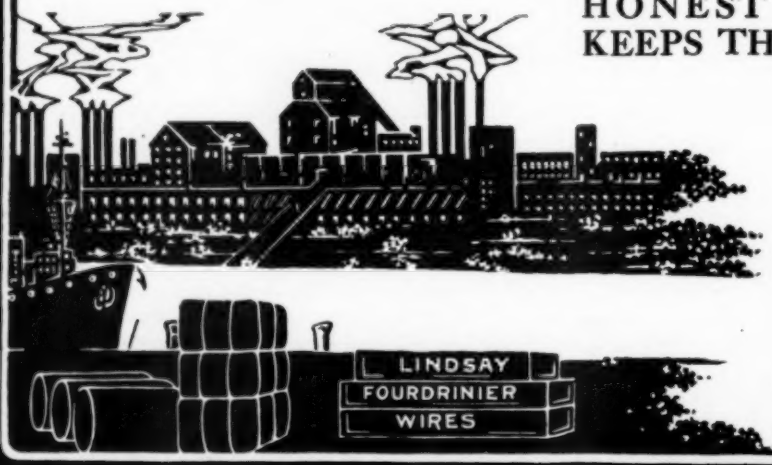
Cheney Bigelow Wire Works

Established 1842 SPRINGFIELD, MASS.

Real Merit Placed

Lindsay Fourdrinier Wires

In Many Mills



HONEST SERVICE KEEPS THEM THERE

They are ready to serve you

The Lindsay Wire Weaving Company

Collinwood Sta., Cleveland, Ohio

"Ask any Papermaker"

is moved by motor power to one side, out of the way of the base. This facilitates removal of worn-out wires and installation of new ones. This operation formerly required about four or five hours. The new Beloit Iron Works development reduces this time to less than forty minutes. It also eliminates danger of tearing the expensive wire and reduces labor to a minimum.

The five bottom press rolls are 26 in. in diameter by 160 in. face, and are covered with 1⅛ in. rubber. These rolls are supported by ring oiled water cooled bearings. The top press rolls are 30 in. in diameter by 162 in. face, and are of granite. All of the wet press felt rolls are 10½ in. and 12½ in. in diameter, rubber covered and are supported on S K F ball bearings. All of the felt stretchers are in the basement and are operated by means of electric motors. are four dryer felts, two above and two below. All of the dryer felt rolls are 12 in. in diameter and are all supported on ball bearings. Each dryer felt is provided with an automatic felt stretcher, which has a travel of approximately 20 ft. and will take care of 40 ft. of stretch in the felts. The lower row of dryer-rolls extend down through the main floor into the basement. There is no floor below these rolls. The felt stretchers for the lower felt are also located in the basement. The dryer gears are all of the cast-iron with the exception of four which are of steel and are located next to the driving pinions. All of the gears have a 7 in. face. The teeth in the gears are all accurately machined.

The calender stack consists of ten chilled rolls. The bottom roll is 28 in. in diameter, the roll next to the bottom is 18 in. in diameter and the top roll is 20 in. in diameter. All of

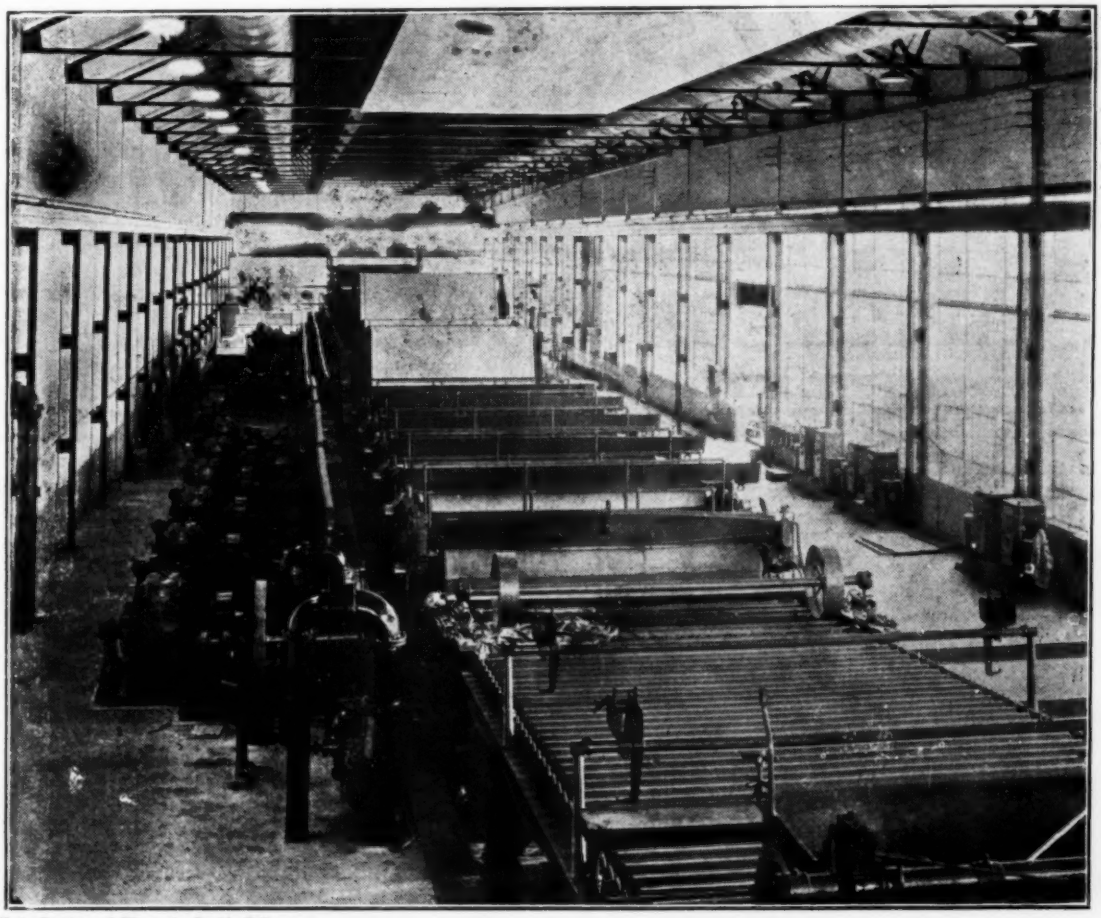


Photo Courtesy of Wisconsin Rapids Tribune

Looking down 325 feet from wet end of machine

The paper travels through all of the presses in the same direction. This differs from the earlier machines, in that the paper travels through the third press in opposite directions to the first and second. This is done in order to arrange the stretcher of the third press above the press itself.

Two Dryer Sections

The dryers are arranged in two sections. All of the dryers are cast-iron with cast-iron heads and shafts. With the exception of the receiving dryers, they are all provided with manholes for installing the syphons from the front end of the machine, and for inspection. Each of the bottom dryers are fitted with doctors. All of the dryer bearings are self aligning, arranged with oil rings and are provided with a continuous flow of oil from a gravity oiling system. There

the intermediate rolls are 13 in. in diameter, and all have a face of 152 in. This stack is provided with Warren Patented Doctors and feeds.

The reel is of the uniform speed type, Pope's Patent. This reel consists of a drum 3 ft. in diameter on which small cylinders, or reels ride and on which the paper is wound. As the paper winds on the small reels and the roll becomes larger in diameter, it automatically shifts to a second set of bearings. A new reel is dropped into the first set of bearing, and as soon as the paper is broken from the first reel it winds up on the second.

The winder consists of two cast-iron drums 15 in. in diameter and 152 in. face. The winder is equipped with seven pairs of slitters of the King's Patent ball bearing type.

Appleton

Felts & Jackets

We have for a long number of years furnished felts for some of the largest pulp, board, news and writing mills in the country.

Manufactured By

APPLETON WOOLEN MILLS

APPLETON ·· —— ·· WISCONSIN

"TYLER"

CORDUROY CLOTH

for SAVEALLS
GROUND WOOD WET MACHINES
WATER FILTERS
SULPHITE WET MACHINES

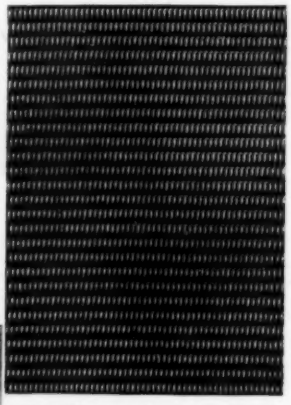
Tyler Corduroy Cloth, for use in the paper making industry, has four distinct advantages over other types of screen, namely:

1—It eliminates the necessity of using backing wires.
2—it gives much longer life than fine face wire.
3—There is no chance for stock to collect between the two covers which occurs where a fine wire and a backing wire are used.
4—Eliminating the backing wire, saves considerable time in applying the cloth to the machine.

Tyler Corduroy Cloth is made from phosphor bronze, monel, or nickel wire, and is carried in stock in all widths up to and including 150 inches.

Samples will be sent upon request.

Also Manufacture Fourdrinier Wires, Cylinder Faces, Washer Wires, Backing Wires



The "Tyler" Corduroy Cloth

THE W. S. TYLER COMPANY

CLEVELAND, OHIO

Sprague electric hoists are used to lift the finished rolls and transfer the reels making possible speedy changes.

Thread by Air Device

In order to thread the paper through the machine at the higher speeds, Pope's Patented air system is used. A strip of paper about 2 in. is cut by means of the squirt on the wire. At the couch high pressure air is directed under this 2 in. strip and blows the strip from the top couch on to the first press felt. The strip of paper is then widened to a 6 in. by moving the squirt inward on the wire. The 6 in. strip of paper is removed from the top press rolls by means of high pressure air to the felt of the next press. It is also blown from the last press to the receiving dryer and from the bottom dryers to the nip between the felt and the top dryers. As the 6 in. strip of paper passes through the presses and the dryers the sheet is widened by slowly moving the squirt inward on the Fourdrinier. By the time the 6 in. strip of paper reaches the last dryer, a sheet of paper is formed the complete width of the machine. At the last dryer a 6 in. strip of paper is cut from the full width by means of an electrically motor operated cutter. The 6 inch strip of paper is blown through the top nip of the calender by means of high pressure air and guides. The strip is then blown through the successive nips of the calenders by air from nozzles placed in the doctors. As soon as the small strip of paper is threaded through the calender, the cutter knife is carried to the rear of the machine along the top dryer roll. As soon as the full width of the sheet passes through the calender-stack the sheet is blown through the nip of the reel. By means of an air hose it is forced to wind on the reel. The paper machine operators do not touch the sheet until the roll of paper is lifted from the reel and transferred to the winder.

Individual Motor Drive

The paper machine is driven by individual motors direct connected to the shaft. There are ten main driving motors. The couch motor is 110 HP. and 167RPM. The five press motors are 75 HP. and 176 RPM. Two dryer motors 110 HP. 178 RPM. One calender motor 110 HP., 163.7 RPM., one reel motor 30 HP., 109 RPM. All of the above motors are direct current, the power being supplied from a direct current generator used for these ten motors. The necessary change in speed is obtained by varying the voltage on the generator. To each of the direct current motors there is belted, by means of a pair of cone pulleys and short belt, a synchronous motor, 20 H., 800 RPM. All of the synchronous motors are parallel and hold the large direct current motors at the proper speed. Each of the synchronous motors travel exactly the same speed and act as policemen watching the speed of the large motors. If any of the large motors try to run faster than the others, the small synchronous motor puts load on the large power motor and holds the speed down so that it will not break the paper. If the large direct current motor should lack in speed the small synchronous motor will act as a motor and help the large motor maintain its speed. The changes in draw of the paper is obtained by means of the small cone pulleys and belts. The control for these motors is located along the wall in front of the machine. The operator can strike out any section without disturbing the remainder of the sections, stop it if he desires, and bring it up to step again and strike it again at exactly the same speed that it was running before he struck it out. This electric drive was designed and furnished by the General Electric Company.

Temperature Control Used

To meet the requirements of the paper maker, the paper machine dryer has been divided into four sections. The temperature of each section is individually regulated by a Tagliabue Automatic Temperature Controller, which uniformly maintains the desired temperature conditions in each dryer, of the section in spite of all interruptions to the flow of the paper. The setting point of these controllers can be quickly and easily changed as conditions demand.

This individual section control makes possible the maintenance of gradually increasing temperatures from the wet end to the dry end of the machine. The gradual stepping up of the temperatures as the drying proceeds, assures quicker and more uniform drying. Thus the machine tender is able to work under precise conditions. As each section of dryers is regulated by a separate controller, he can change the temperature in any one section, independent of the others. A turn of the indicating hand, on a plainly marked controller face, graduated in degrees Fahrenheit, results in an instantaneous change of temperature setting. A large dial thermometer, provided for each section, instantly indicates the new temperature the controller is maintaining. A recording thermometer, also provided for each section, tells at a glance the previous as well as the present temperature conditions of the section and provides permanent records.

Each controller operates two diaphragm motor valves, one on the exhaust steam and the other on the live steam to their respective manifolds of the section. The exhaust steam is used for all ordinary demands—being augmented by live steam only when necessary. This exact regulation assures maximum utilization of exhaust steam with a minimum consumption of live steam.

No attention to temperature is required when the machine is down. The machine tender need not shut off steam or make any other adjustments to prevent the development of an excessive temperature at the wet end which might burn the paper when operation is resumed; injure the felts; and waste steam. The proper temperature conditions from end to end of the dryer are automatically maintained—whether paper is passing through or not.

The average paper maker would ask for nothing more. Not so, however, with the Engineers of the Consolidated Water Power & Paper Company. They insisted upon having an automatic "Shut Off" controller, a device that would automatically shut off both the exhaust and live steam entering the first and second sections of the wet end, when a break occurred. The Tagliabue Company was not found lacking in resourcefullness and met the requirements fully. This distinctive feature will henceforth be included with the Standard Tag System.

Prompt and effective drainage of the condensation from the drip manifold of the dryer has been obtained by dividing this manifold into sections corresponding to those of the inlet manifold and applying a Tag Automatic P. & W. Condensation controller to each section.

Back pressure on the drip manifold is prevented by these controllers which, at all times, maintain a water-seal between the drip manifold and the return line to the feed water heaters.

Entrapped air in the dryer has been eliminated by the simple and direct means of a Nash Vacuum pump which is connected through a header to each dryer. A patented Tag fitting prevents the possibility of excessive steam or condensation being forced through the vacuum line.

Valuable time is saved in starting up after a shut-down by this dependable method of air evacuation. The dryers are quickly cleared of air and as a result the machine can be brought to the proper temperature in a very short time.

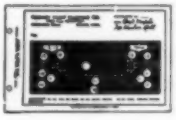
Effective reclamation of all heat units, not used in the dryer, has been given every consideration. Not only the heat in the condensation from the drips, but the heat in the entrapped air is economically recovered.

All controllers used in the Tagliabue System require compressed air at fifteen pounds for the functioning of diaphragm valves. Difficulty in obtaining air free from moisture and oil has been eliminated in this system by a distinctive method. A refrigerating unit cleans and dries the air assuring at all

PIONEERS *Three Departments Specializing for Service* ORIGINATORS

Registered Wood Rolls

For all makes and sizes of Machines, including Textile, Paper, Laundry, Tanning, etc.



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"Rodney Hunt" Turbine and Rim Leverage Water Wheels and Equipment for developing water power from large, medium and small streams.

Water Controlling Apparatus
Wood and Steel Penstocks, Flumes, Canal Gates, Valves, Hoists, Screens, Fittings.

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Heavy Shafting, Bearings, Hangers, Clutches, Pulleys, Gears, and Accessories

A Book of Complete Information "Power Development of Small Streams" 178 pages, illustrated, $3.50

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Also Textile Wet Finishing Machinery for Goods in Roll or String
Write Textile Machinery Department for circulars

RODNEY HUNT MACHINE COMPANY, 45 Mill St., Orange, Mass.
ESTABLISHED 1873

Dominion Engineering Works, Ltd.

MONTREAL, QUEBEC

Designers and Builders of

HIGH SPEED NEWS MACHINES

Of Modern Design and Construction. Fourdrinier and Cylinder Machines of All Kinds. ROTARY SCREENS (System Spangenberg) for Pulp or Paper

HYDRAULIC TURBINES

Of the Largest Sizes and Highest Efficiencies

SPIRAL PUMPS for Medium and Low Heads. *Built from* I. P. Morris Designs, *Under Arrangement with* The Wm. Cramp & Sons Ship and Engine Building Co.

Operating Modern Machine Shop and Iron Foundry equipped to handle the largest classes of

GENERAL MACHINE WORK

times perfect, continuous operation of the automatic controllers.

All of the indicating, recording and controlling instruments which comprise the Tagliabue System, have been suitably mounted in dust and waterproof cases on pilasters which face the front side of the machine. There are five panels in all; one for each dryer section and one master control panel. From the master control panel the operator can open or close all steam valves on both live and exhaust lines, to all section manifolds by moving a pointer mounted on a dial. On this dial is inscribed the words, "Steam Off"—"Steam On."

It is not necessary for the operator to leave the machine floor to ascertain if the condensate is being discharged from the drip manifolds. Each section panel is provided with a recording instrument which gives a graphic story as to "when" and "how long" the drip manifold discharged its condensate. Another recording instrument is provided for the convenience of the management. The instrument not only indicates when "breaks" occured, but also how long the machine was shut down.

New Systems Adopted

The Sturtevant vapor absorption system consists of one large fan which furnishes 120,000 cu. ft. of air per minute along the roof and walls of the machine room proper, and 40,000 cu. ft. of air per minute in the basement below the dryers.

The heated air supplied to the machine in the basement filters up through the machine and picks up the moisture enroute to the hood located in the roof trusses above the machine. The air piping in the machine room is located in the roof trusses and is so arranged to pick up any moisture that may escape from the hood. The hood extends the entire length of the dryers and is connected to a specially designed monitor, which will allow the moist air to escape regardless of the direction and velocity of the wind outside of the building.

Lubrication

In recommending lubricating oils to do a certain class of work such as on this large paper machine, first and foremost under consideration is the "oil film" which must be produced in order to prevent metal to metal contact between any two surfaces.

For the dryers the basis of selection depended not only upon the high temperature but also on the weight. The oil recommended by the engineer of the Standard Oil Company to take care of this lubrication was Zone Motor Journal Oil. This oil has a high fire and flash, maintains the proper viscosity under the temperature of 275 degrees F. or more to which it is subjected.

On the press rolls where weight was the principal factor, under consideration, Atlantic Red Engine Oil is used.

On the Fourdrinier, Superla No. 39 Grease was recommended for the ball bearings.

On the dryer felt rolls which are also equipped with ball bearings, Superla No. 39 Grease was recommended. This high grade grease stands up well under extreme cold and hot conditions.

For all motors, direct, alternating and synchronous Renown Motor Oil is used. This lubricant at all times maintains a perfect film of oil between motor bearings and armature shaft.

On the main calender roll which weighs seventeen tons and is subjected to a high degree of heat, Zone Motor Journal Oil is used.

On the remaining nine upper calender rolls, where speed is the main factor, Atlantic Red Engine Oil is used. Weight was given minor consideration in making the selection of the lubricant.

On all gears and pinions Standard No. 2 Pinion and Gear Grease was recommended. It is a heavy bodied grease made especially for gears and pinions. It has an adhesive quality which does not permit it to fall or peal off from the surface to which it is applied. Instructions were carefully adhered to, with respect to having the teeth thoroughly cleaned before applying the grease. An excellent cushion between teeth surfaces was obtained.

No Beaters Used

No beaters are used in connection with this machine. Ground wood pulp and sulphite pulp are pumped to a Trimbey Automatic Mixing Box, where definite amounts of sulphite and ground wood pulps are mixed with definite quantities of size, alum and color. From the mixing box stock flows through a jordan of the majestic size, manufactured by E. D. Jones & Sons Co., driven by a synchronous motor. From the jordan it flows to one end of the machine chest which is 65 feet long, 14 feet wide and 14 feet high, equipped with agitators. On the opposite end of the chest the stock is pumped by means of a 12x12 triplex pump to a Feeney automatic regulator, where a definite amount of stock is allowed to flow to the fan pump box. The fan box is 5 feet long, 5 feet wide, and 16 feet high. The stock from the Feeney regulator and the white water from the machine, are allowed to mix in the box. Three suction pumps are used. Two are connected to the suction boxes under the Fourdrinier wire and one to the suction box on the first press felt. These suction pumps are of the Nash type driven by individual motors.

Run 61 Motors

This machine and all of its accessories are driven by individual motors throughout. There are sixty-one motors totaling 1462 HP. used for driving this machine and its accessories.

Building Construction

The machine is housed in a specially designed building 54 feet wide and 400 feet in length. There is a basement under the entire machine which has a height of 18 feet. One side of the building and one end is built nearly entirely of windows of the steel daylight type. The roof is constructed of gypsum tile, 6 inches thick, manufactured by the United States Gypsum Co., and is covered with felt and asphalt tar.

The building was designed by L. A. DeGuerre, Industrial Engineer, of Wisconsin Rapids, who for the past ten years has made for the Consolidated Water Power & Paper Co. something over seven hundred separate drawings and engineered at least $5,000,000 worth of work. The company's interests have grown so large, they now have an engineering department of their own and presumably will take care of their own projects in the future.

Without seeing the new machine and the building in which it is located, it is difficult to realize its immense size. It required 44 cars to ship the paper machine proper from Beloit to Wisconsin Rapids, 8 carloads of electrical machinery, 3 carloads of other machinery not furnished by Beloit, 46 cars of stone for concrete, 100 carloads of sand, 32 cars of cement, 61 carloads of brick, 11 carloads of reinforcing and structural steel, 2 carloads of glass, 3 tons of putty, and 14 carloads of tile.

The engineers of the paper company and machine company are willing to admit that the cooperation and advice of the various companies furnishing accessory equipment, were instrumental in the achievement of successful operation.

Such well known companies as the following, had at some period or other, a representative in attendance to supervise the installation or erection of their own particular equipment.

Motor drive.....General Electric Co.
Rolls and deckle strap.....U. S. Rubber Co.
Lubricating oils.....Standard Oil Co.
Air jets for blowing paper thru machine..Pope Appliance Co.
Automatic temperature and Condensate control.....
.....C. J. Tagliabue Mfg. Co.
Screens .....Bird Machine Co.

LISBON PULPSTONES

Quantity Unlimited Quality Unsurpassed
Guaranteed to Give Satisfaction

A free cutting Pulpstone that will produce more Pulp and withstand speed and pressure.

Magazine Grinder Stones in All Sizes
Samples and Quotations on request

The Smallwood-Low Stone Co.

World's Largest Producers of Pulpstone
LISBON, OHIO, U. S. A.

PUMPS

Until recently, pumping devices similar to this were in occasional use in parts of the United States.

Centuries before the Christian Era, the inventive Chinaman had developed a rather efficient pumping device. A bullock turned the wheel. Wooden pegs on the rim of this wheel meshed with the smaller wheel on the long shaft. A heavy chain, equipped with buckets, descended into the well and drew forth the water which was carried to the gardens and fields.

All things considered, this was a fairly efficient device. Modern American-Marsh Pumps are **wholly** efficient. They can be depended upon, year after year, for reliable, effective and powerful service.

Write for bulletins

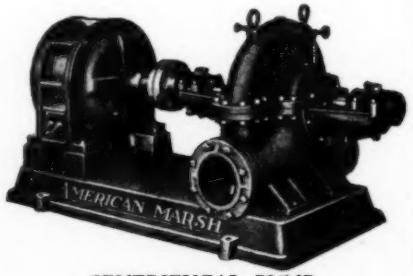
American Steam Pump Co.

Battle Creek, Mich.

Chicago Office
1220 Monadnock Block

New York Office
17 Battery Place

The American-Marsh line also includes Boiler Feed Pumps, Power Pumps, Air Compressors, Vacuum Pumps, Condensers, Deep Well Engines, Stock Pumps.



CENTRIFUGAL PUMP

Fourdrinier felt.....Orr Felt & Blanket Co.
Fourdrinier suction pumps.....Nash Engineering Co.
Kenwood felts and jackets.....F. C. Huyck & Sons
Fourdrinier wires.....Appleton Wire Works
Pump stuff from mixing box to screens.....Gould Mfg. Co.
Pumps stock from mixer to Jordan Engine.....
.....Worthington Pump & Mach. Co.
Patented doctors for calenders....Ticonderoga Mach. Works
Pope patented reel.....Rice, Barton & Fales Mach. Co.
Jordan Engine.....E. D. Jones & Sons Co.
Multivane fan hot air blower.....B. F. Sturtevant Co.
15 ton overhead travelling crane for erection of paper machine.....Whiting Fdry. & Equip. Co.
Feeney stock regulator.....Baker Mfg. Corp.
Note: This regulates the amount of stock to screens or machine, thereby keeping paper to weight.
Trimbey-Allen mixing box.....Sandy Hill Iron Works

Program for Fall Convention of T. A. P. P. I. and Superintendents

Invitations for the Joint Fall Meeting of the American Pulp and Paper Mill Superintendents' Association and the Technical Association of the Pulp and Paper Industry, which is to be held at Washington, D. C.; York, York Haven, and Spring Grove, Pa., with closing meetings at Philadelphia and Wilmington, will shortly be sent out from the secretary's office. As now arranged, the first day of meeting will be spent in Washington at the Industrial Building of the Bureau of Standards; the second day in York, York Haven, and Spring Grove; the third day in Philadelphia; and the fourth day in Wilmington, Del.

The American Pulp and Paper Mill Superintendents' Association has been asked to name additional representatives to serve on the local committees for Washington, York, Philadelphia and Wilmington.

It was inadvertently announced that H. W. Ellerson of the Albemarle Paper Manufacturing Company, Richmond, Va., had been named as a member of the local committee for Wilmington. This was an error, as Mr. Ellerson is attached to the Washington committee, of which Fred A. Curtis is chairman and Daniel A. Smith and Edward O. Reed are associates.

A revised draft of the program of meeting and mill visitations follows:

Tuesday, October 18

9:00 a. m.—Assemble at Industrial Building of the Bureau of Standards for reading and discussion of papers in general and group meetings arranged by T. A. P. P. I. Service Committee, and committee of A. P. & P. M. S. A.

12:30 p. m.—Luncheon, Bureau of Standards.

2:00 p. m.—Inspection of sections of the Bureau of Standards; visit to Paper and Dye laboratories of the Bureau of Chemistry; optional visits to Government Printing Office, Bureau of Engraving and Printing, and mill of District of Columbia Paper Manufacturing Company.

7:00 p. m.—Supper at New Willard Hotel, followed by smoker, and continuation of papers, group meetings and discussions.

12:00 p. m.—Take Pullman cars for York, for visits to York, York Haven and Spring Grove.

Wednesday, October 19

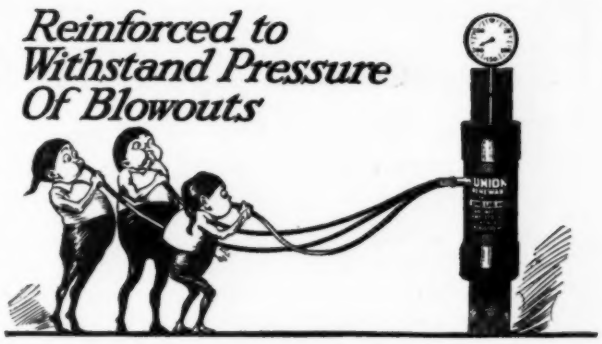
Mill and Plant Visitations in York, York Haven and Spring Grove, Pa. Leave Washington for York, Pa., by midnight train. Breakfast on arrival at York. Visits to plants in York and York Haven, followed by trip to Spring Grove in afternoon.

Leave York for Philadelphia in evening.

Thursday, October 20

Breakfast in Philadelphia at Bellevue-Stratford, association headquarters, where members and guests will register for

Reinforced to Withstand Pressure Of Blowouts



The weakest points in most fuses are at the ends of the fibre tube where threads have been cut to hold the ferrules. It is there that ordinary fuses usually give way under the pressure of severe blowouts.

These weak points in ordinary fuses are the *strongest* points in "Union" Fuses because of their different construction. Instead of screwing ferrules *inside* the fibre tube, they are screwed on the *outside* of "Union" Renewable Fuses. Thus, "Union" Fuses are *reinforced* with heavy brass bands at these points.

And instead of depending upon the threads alone to hold the ferrules on the tube, they are both riveted and screwed onto the tube in

"UNION" RENEWABLE FUSES

We were the pioneers in the manufacture of fuses having the brass ferrules *permanently* attached to the fibre tubing in the knife-blade types—the first to see the big advantage of metal to metal cap and base.

Throughout, "Union" Renewable Fuses are of the most rugged construction. Every part is heavy enough and strong enough to insure effective, *lasting* service. This explains why they withstand a greater number of blowouts than any other fuse. It explains why "Union" are the cheapest renewable fuses in the long run.

"Union" Fuses, both Renewable and Non-Renewable, are for sale by all leading electrical jobbers and dealers.

Free descriptive booklet on request.

The "Union" saves more than ANY other renewable fuse.

Chicago Fuse Mfg. Company

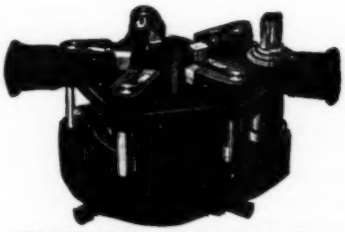
UNION

Manufacturers of Switch and Outlet Boxes, Cut-Outs, Fuse Plugs, Automobile Fuses, Renewable and Non-Renewable Enclosed Fuses.

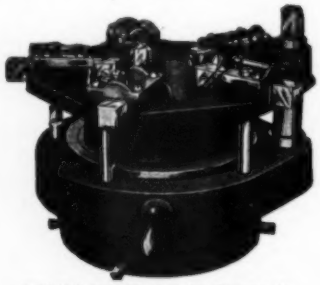
CHICAGO **NEW YORK**

Fast, accurate pipe-fitting with "Toledo" Pipe Tools

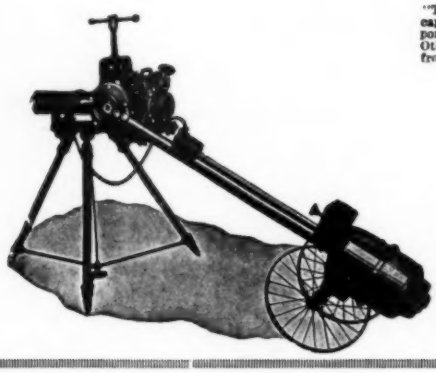
THE "Toledo" line of Threaders, Cutters and Power Drives represents pipe-fitting equipment which cannot be equalled for accurate work, fast performance and general utility. They are ideal for quick emergency work and equally capable of handling the biggest, most complicated pipe fitting jobs. Send for catalog and Power Drive bulletin.



"Toledo" adjustable geared threader No. 2, capacity 2½ to 4-inch pipe inclusive. A light, portable device that threads fast and accurately. Other adjustable hand threading devices for pipe from ⅛ up to 12 inches.



"Toledo" geared adjustable threader No. 25, capacity 2½ to 6-inch pipe inclusive. The patented construction of this threader eliminates weaknesses generally found in devices where camplate principle is used for die adjustment to various sizes.



"Toledo" Power Drive for operating "Toledo" Geared Pipe Tools

Cut to left shows "Toledo" Drive operating "Toledo" Cutter No. 230. Capacity of cutter is 2½ to 6-inch pipe inclusive. Cuts clean and straight, leaving no burr. Power Drive is interchangeable and will drive ALL "Toledo" geared tools; it is simply constructed, portable and will operate any tool FIVE times faster than hand operation with ratchet handle or driving cross.

THE TOLEDO PIPE THREADING MACHINE CO. **TOLEDO, OHIO**

NEW YORK OFFICE: 50 CHURCH STREET, NEW YORK CITY

WILLIAM GANSCHOW COMPANY

CHICAGO, ILL. U.S.A.

MANUFACTURERS OF

WORM GEAR & SPUR GEAR SPEED REDUCERS

Let us help you figure out your Spur Gear and Worm Gear Reducer Problems.

WE DO IT FOR OTHERS, WHY NOT FOR YOU?

Our Mechanical and Engineering Department is open, at all times, for your convenience.

OUR 50 YEARS EXPERIENCE IS YOURS FOR THE ASKING

WILLIAM GANSCHOW COMPANY

Washington Blvd. and Morgan Street, Chicago, U. S. A.

visits to the various mills and plants to be inspected during the day.

7:00 p. m.—Banquet at Bellevue-Stratford.

Friday, October 21

Excursion to Wilmington, Del.

Leave Philadelphia for Wilmington by early train. Breakfast at Cafeteria of Pusey-Jones Company on arrival, followed by visits to plants as follows:

Pusey-Jones Company.

Du Pont Company's plant at Corney's Point.

Inspection of laboratory and dye works of the du Pont company.

Sightseeing—It is suggested that visitors desirous of sightseeing in Washington will plan to do so on Monday, October 17.

Registration—Members and guests are expected to register at New Willard Hotel, Washington, association headquarters, on arrival, either Monday or Tuesday, October 17 or 18. It is planned to start the convention on Tuesday morning at the Bureau of Standards, promptly at 9:00 o'clock.

The chairman of the local Committee of Arrangements is Fred A. Curtis, chief of Paper Section, Bureau of Standards, Washington, D. C. Grellet N. Collins, of Dill & Collins, Philadelphia, is in charge of the arrangements for Philadelphia Day; W. S. McClellan, of P. H. Glatfelter Company, for the York district, and Harvey G. McDowell for Wilmington.

Miami Cost Association Meets with Superintendents

A very successful joint meeting of the Miami Valley Cost Association and the Miami Valley Superintendents' Association was held on Tuesday evening, August 2nd at the Butler County Country Club. The speaker of the evening, Col. B. A. Franklin, vice-president of the Strathmore Paper Company, Mittineague, Mass., was introduced by Mr. Thos. Beckett, president of the Beckett Paper Company, Hamilton, Ohio. Col. Franklin went into detail explaining the cost system used by the Strathmore Paper Company and laid particular stress on the following points:

1.—That your cost system must prove with the books; 2.—That your system must be operated with practical accuracy; 3.—To visualize cost with imagination—make figures draw pictures; 4.—To interpret with practical instinct; 5.—Your cost system ought to be braced with standards—make a theoretical standard; 6.—Verified by comparison; 7.—Make simple by arrangement; 8.—Constant check on every operation; 9.—Your cost system must be made active by the co-operation of every one in the organization.

After Col. Franklin had concluded his remarks the last half hour was devoted to questions, which the speaker answered.

The following mills were represented:

Beckett Paper Co., Vulcanite Roofing Co., Wrenn Paper Co., American Writing Paper Co., Miamisburg Paper Co., Gardner-Harvey Co., Harding Paper Co. and Peerless Paper Company.

Visit the Chemical Exposition

What will no doubt be the greatest Chemical Exposition ever held in America will take place in the 8th Coast Artillery Armory in New York City, September 12-17.

Something like four hundred exhibitors will show their products to the public and manufacturers and leaders of practically every industry in the United States will view the exhibits and hear prominent men address them on important topics.

Motion pictures will be shown, with discussions on many important topics to paper and pulp manufacturers. The American chemical and dye stuff industry will be very

UNION SCREEN PLATE CO.
Fitchburg, Mass., U. S. A. Lennoxville, P. Q., Canada

UNION BRONZE SCREEN PLATES
(Best phosphorized Cast Metal)

Old Plates RECLOSED and RECUT to accurate gauge
UNION BRONZE SCREWS for Screen Plates
Immediate Delivery of the Largest Orders. Satisfaction Guaranteed

The Witham Screen Plate Fastener, Patented
THE ORIGINAL THE BEST

SCREEN PLATES *and* DANDY ROLLS

Watermarking a Specialty

Central Manufacturing Co.
The Quick Service House
KALAMAZOO MICHIGAN

Remember
WM. A. HARDY & SONS
FITCHBURG, MASS.
Originators and Oldest Manufacturers
OF THE
Cast Bronze Screen Plate
ALSO SPECIALIZE IN
Acid Resisting Digester Parts

Ticonderoga Machine Works
TICONDEROGA, N. Y., U. S. A.
MANUFACTURERS OF
WARREN IMPROVED CALENDER DOCTORS
With Flexible Blades, Universal Adjustment and Control
(PATENTED)
WARREN IMPROVED PATENT DOUBLE DRUM WINDERS
Patent BALL VALVE Hydrant
Stock Circulating Systems *and*
other Paper Mill Specialties
SEND FOR OUR BULLETIN

NORWOOD

High Grade Paper Finishing Machinery

Super Calenders
Platers
Rag Room Equipment

Write for Information

NORWOOD ENGINEERING CO.
Florence, Massachusetts, U. S. A.

When it is a matter of

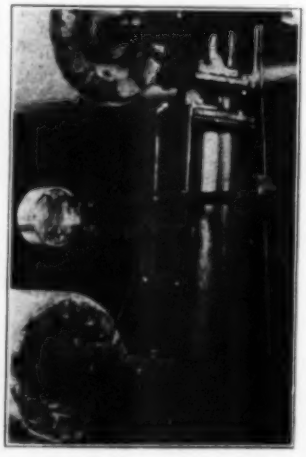
CHIPPER and BARKER KNIVES;
RAG CUTTER, ROTARY CUTTER
and PAPER TRIMMING KNIVES,
FLY BARS and BED PLATES
for BEATERS and WASHERS,
JORDAN ENGINE FILLINGS,

THINK OF

BOLTON QUALITY

JOHN W. BOLTON & SONS, Inc.
LAWRENCE, MASS.

Intensive specialists in the manufacture of uniformly high grade machine knives for the pulp, paper and board industry



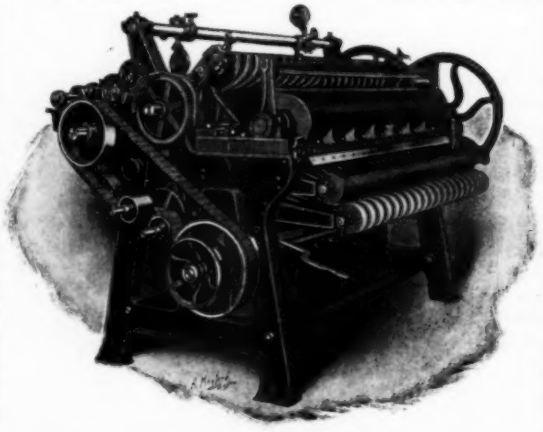
Have You Heard of the

New Safety Device

for your PAPER MACHINE REELS?

The Object Is—TO AVOID DRAGGING MEN AND CLOTHING IN BETWEEN REELS

Nekoosa Motor & Machine Company
We Solicit Your Inquiries Nekoosa, Wisconsin



PAPER CUTTERS

Single, Duplex, and Diagonal

CUTTER KNIVES
PATENT TOP SLITTERS

Hamblet Machine Co.
LAWRENCE, MASS.

prominent in the exhibits and study of this section and is well worth the trip to New York to visit this exposition.

Every paper and pulp manufacturer, particularly those interested in any branch of chemistry, will no doubt be benefited by having a representative visit and make a study of the exhibits shown.

One of the important features of the exposition will be the question of conserving wastes in the different industries, and manufacturers are invited to take their problems with them to the exposition.

Indiana Industrial Exposition

Paper distributors and manufacturers in Indianapolis are planning to take a large part in the Indianapolis Industrial Exposition to be held October 10 to 15 at the Indiana State Fair Grounds under the auspices of the Indianapolis Chamber of Commerce.

Space has already been taken by more than 400 of the 781 different lines of manufacturing in Indianapolis. One of the unique features of the exposition will be that the huge Manufacturers' building will be laid out in replica of the retail district of Indianapolis, with the world famed Soldiers' and Sailors' monument towering in the center of the network of streets named after those in down-town Indianapolis.

The convention of the National Purchasing Agents Association held this same week in Indianapolis, bringing to the city at least half of the corporate buying power of the country, is adding an interest to the Exposition.

"Industrial Indianapolis under one roof will surely stimulate the buying of Indianapolis-made products. Indianapolis leads the world in many lines. It ranks high in the paper and printing industry," says Howard J. Lacey, of the U. S. Corrugated Fiber Box Company.

Duty on Test Board Is Boosted

The Committee on Ways and Means allowed an amendment to the Tariff Bill, paragraph 1302, covering "Paperboards and Pulpboards," to read as follows:

"Page 156, line 7, after the semi-colon, insert 'test or container boards of a bursting strength above sixty pounds per square inch by the Mullen or Webb Test, 15 per cent. ad valorem.'"

The duty on pulpboards and paperboards generally remains at 10 per cent. ad valorem.

The Box Board Manufacturers' Association and the Eastern Paperboard Manufacturers' Association asked for a general 25 per cent. ad valorem or a specific duty of one cent per pound on all box boards and endeavored to convince the committee that box board generally should have this amount of protection, in view of foreign competition which is not only actually here but seriously threatens our business in the future.

The sub-committee in charge of these schedules took the position that no important competition has been in evidence except the imports from Canada which according to the Tariff Commission have been largely on the grades known as test boards. The sub-committee further took the position that America is able to take care of herself in all the grades of boards made from waste paper.

It was the hope of the manufacturers to have these amendments in satisfactory shape so as to avoid hearings before the Senate Finance Committee which now takes the tariff bill for further consideration.

Under the circumstances, it will be necessary to present their claim for the consideration of the Senate Committee and there is reason to believe that they will receive careful attention there to the end that they may ultimately get something like what is needed for the protection of the industry.

The committee also made another amendment of interest

BROWNHOIST

Increased handling capacity at one-half the cost

To double your handling capacity and at the same time cut the unit cost in half is certainly worth while. The Brownhoist locomotive crane shown above is doing this at the paper mills where it is working. This crane handles 85 thousand feet of timber per day at a cost of 70 cents per thousand. This is against 45 thousand feet at a cost of $1.48 per thousand under the former method.

In addition to the speed and low cost of upkeep of Brownhoist cranes their great flexibility should be considered. Practically all kinds of materials can be handled anywhere as Brownhoists are made to operate on traction wheels or creeper trucks as well as railroad trucks. And the saving of handling materials by locomotive crane is usually as great or greater than the above.

Catalog K shows many types of Brownhoist cranes working in different industries. If you have any handling problems you will be interested in seeing how some Brownhoist owners are solving theirs. Write us. The knowledge of 40 years of crane building is at your service.

The
Brown Hoisting Machinery Co.
CLEVELAND, OHIO, U. S. A.

Engineers and Manufacturers of Heavy Dock Machinery, Bridge Cranes, etc., as well as smaller Cranes and Hoists

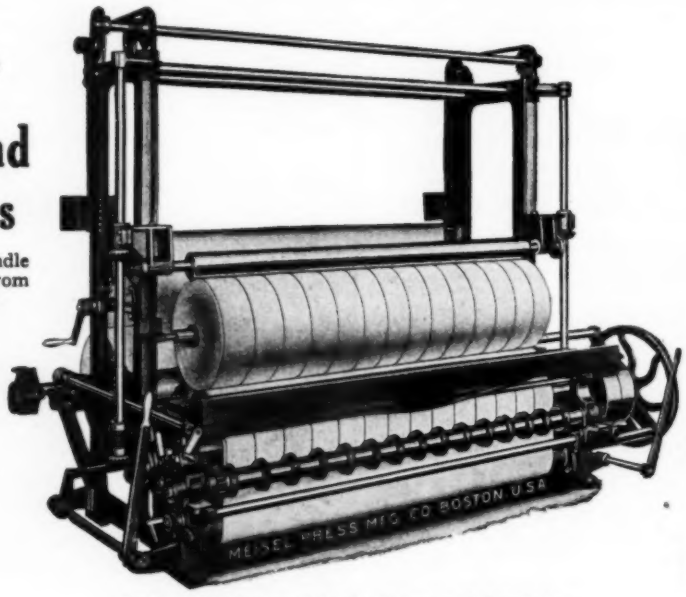
Branch Offices in New York, Pittsburgh, Chicago, San Francisco and New Orleans

Manufacturers of

Slitters and Rewinders

Any width, to handle any weight paper from tissue to cardboard.

Rolls up to 40 inches in diameter



Series OM Medium Weight Slitter and Rewinder

Manufacturers of

Adjustable Sheet Cutters

for tissue, waxed and other papers.

Rotary or Bed and Platen Presses

for printing all classes of paper, tissue to cardboard.

MEISEL PRESS MANUFACTURING CO.

948 Dorchester Ave., Boston 25, Mass.

The BLACK-CLAWSON Co.

HAMILTON, OHIO

Builders*—Paper and Pulp Mill Machinery—*for

INCREASED PRODUCTION **SERVICE ALWAYS**

to box board and other paper manufacturers, paragraph 1455, page 179, reads as follows:

"Waste, not specifically provided for, ten per cent. ad valorem."

The manufacturers pointed out to the committee that this might be interpreted to include waste materials for the manufacture of box board or other grades of paper and suggested that it should be corrected so that no misunderstanding or misinterpretation might occur. The committee therefore passed the following amendment:

"Page 202, line 16, strike out the period after the word 'pulp', insert a semicolon, and add the following: 'Paper stock, crude, of every description, including all grasses, fibers, rags, waste, including jute, hemp, and flax waste, shavings, clippings, old paper, rope ends, waste rope, waste bagging, and all other waste not specially provided for, including old gunny cloth and old gunny bags, used chiefly for paper making, no longer suitable for bags.'"

The above therefore becomes a part of Title 2 of the bill which is the free list and of course does away with any probability of misconstruction of paragraph 1455.

Vocational Education Textbooks

Many inquiries are being made regarding the scope of the Vocational Education Textbooks on the manufacture of pulp and paper, and for the information of those of our readers, who might be interested, the following statement is submitted regarding the course of instruction in papermaking which is provided in the textbooks.

The course of instruction is to be completed in five volumes and volume I and II are now on sale at $5.00 each. The price of succeeding volumes has not been established but it is unlikely that they will exceed more than a dollar or two, that of the two volumes now on sale.

Volumes I and II deal with the preliminary educational requirements of the student, volume I, for example, covering arithmetic, elementary applied mathematics, how to read drawings, and elements of physics. The work is divided into the sections named and bound into a volume for reference purposes; it is also obtainable in pamphlet form for students who wish to master one part at a time and for convenience in the classroom, the idea being to proceed progressively so as to enable the student to master each section in its natural order, but complete volumes must be ordered to obtain the sections and study papers.

In volume III, the sections will cover production and properties of woodpulp, wood preparation, mechanical pulp, sulphite pulp, soda pulp, sulphate pulp, treatment of pulp, refining of pulp, bleaching of pulp, and analysis and testing of raw materials.

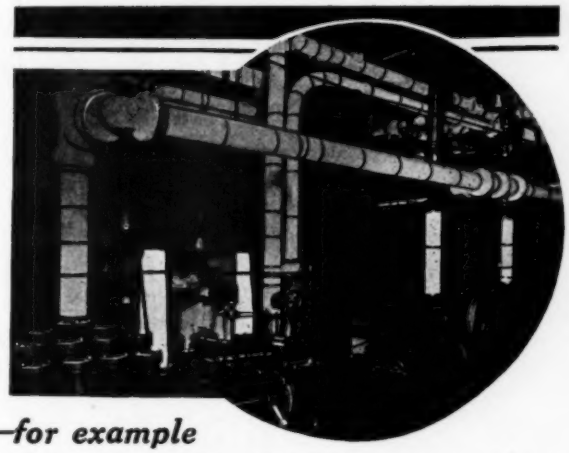
Volumes IV and V will deal with the manufacture of paper, the courses of study in these volumes including preparation of rag and other fibers, treatment of waste papers, beating and mixing, engine sizing, coloring, loading, papermaking machines, tub sized papers, hand made papers, finishing operations, manufacture of special papers, boards, etc., coated and other treated papers, paper testing, laboratory equipment, general mill equipment, trade customs and mill organization, and dictionary of papers, tables, etc.

Orders for the volumes should be addressed to the Technical Association of the Pulp and Paper Industry, 542 Fifth Avenue, New York, accompanied with check or money order in payment.

Authorizes Conference on Pulpwood

The House on August 1st, adopted a Senate resolution authorizing appointment by the President of a commission to confer with the Canadian Government or the Provincial Governments of Quebec, Ontario and New Brunswick as to certain restrictive Orders in Council of the three provinces relative to exportation of pulpwood to the United States.

PIPING FABRICATED & ERECTED



—for example

This unusual piping fabricated and erected for the Diamond State Fibre Co. typifies the unusual service we can render to users of piping in the paper industry.

The unusual problem in modern piping is the most usual task that comes to the M. J. D. Organization Headquarters. The most intricate design is not beyond the capabilities of our engineers. Our years of experience in fabricating and erecting piping systems for every purpose justify our claim to specialists in this work.

Concerns who rely on Dougherty Piping

A list of plants that have and continue to rely on M. J. D. piping service would read like a roll of honor of modern plant efficiency. A few are listed below:

Diamond State Fibre Co.
West Virginia Pulp & Paper Co.
Edison Portland Cement Co.
Virginia Carolina Chemical Co.
United Paperboard Co.
Hinckley Fibre Co.

Each of these installations was different—each an engineering problem. On one, a waste heat boiler installation, a **saving of 150 tons of coal daily** was effected. The same concern placed additional repeat orders including a water cooling system.

Our Increased Facilities—Quantity and Quality

Having recently acquired increased facilities by taking over a larger plant, we are now in a better position to offer our services to a larger field of clients.

As Piping Fabricators and Contractors we can handle your entire installation from the time you conceive it until it becomes a finished M. J. D. product. Or we can co-operate with your engineers, fabricating and erecting the piping according to your plans, or, we will furnish materials only. Our prices are right up-to-the-minute—LOW.

Let us send you our Bulletin N-8

M. J. DOUGHERTY CO.
PIPING FABRICATORS & CONTRACTORS
FACTORY & MAIN OFFICES—25th & WASHINGTON AVE. PHILA. PA.

OUR LINE

WOODEN TANKS

There's a difference in tanks—we can prove this if afforded the opportunity. Our tanks are scientifically made by trained experts and are absolutely guaranteed. Built to order only—any size for any purpose.

We maintain a department for co-operation with engineers and chemists in solving problems encountered in selecting and installing wooden tanks for acid and chemical solutions.

Pittsburgh Office
406 Bakewell Bldg.

THE HAUSER-STANDER TANK CO.
CINCINNATI, O
U.S.A.

Pure Drinking Water
Keeps Workmen Healthy

Physiologists agree that in order to keep the body in a normal state of health, a man should drink the equivalent of not less than seven glasses of water each day. Pure drinking water is a primary requisite for hygienic living and helps to keep the body free from all intestinal disturbances.

Stimulate the efforts of your employes and save their time in going to inaccessible hydrants by piping clear, cold water to them by means of Milwaukee's

"Famous" Cooler Fountains

This fountain includes a barrel of 1½" thick oak, painted outside; cover of double thickness; galvanized pipe coil through which water passes to drinking head without coming in contact with ice, and a heavy vitreous china bowl with either cast brass bubbling head with self-closing stop or "Vertico-Slant" stream from which glass can be readily filled.

RUNDLE-SPENCE MFG. COMPANY
MILWAUKEE *Write for Catalog* WISCONSIN

JENSSEN ACID TOWERS
at Nekoosa Edwards Paper Co.
Port Edwards, Wisconsin

62 Jenssen Tower Installations

GREAT ECONOMY has been effected in mills where the

JENSSEN Two-Tower Acid Systems

have been installed

Sixty-two Installations now in operation or building

U. S. A., Canadian and European Patents

G. D. Jenssen Co.
200 Fifth Ave., New York

A REAL Solution to Newsprint Handling

Picks up from either horizontal or vertical position a 72" roll or its equivalent in small rolls.
Stacks on end in car or warehouse.
Easy and simple to handle and will operate all day on a 25-cent charge of electricity.

Write for information on Type L

The Elwell-Parker Electric Company
"Pioneer Builder of Electric Industrial Trucks"
Cleveland, Ohio, U. S. A.

Chicago's Pageant of Progress

Chicago's great Municipal Pier has been converted into one of the greatest industrial exhibitions ever held in the middlewest. The Pageant of Progress is the fruition of an idea which was created in the minds of a group of Chicago's business merchants, headed by Mayor Wm. Hale Thompson, to bring about a resumption of business activity and is drawing vast throngs into the city during the two weeks in which it is held, July 30 to August 14, 1921.

The Paper Products Section, of which George J. Kroeck is chairman, has many interesting exhibits of paper product manufacturers. Among them are the Kroeck Paper Box Co. who are actually demonstrating the manufacture of boxes. The H. Schultz & Co. Paper Box Co. also have a similar exhibit. Other exhibitors in this section are: The Sefton Manufacturing Co.; The Mid States Gummed Paper Co.; The Mid West Box Co.; Louis Dejonge & Co.; National Association of Corrugated and Fibre Box Manufacturers; Seaman Paper Co.; Favor Paper Ware Co., and Gaw-O'Hara Envelope Co. The latter are demonstrating to the people how envelopes are made.

The paper section contains more than 60 booths, and there are many more sections. Almost the entire industry of Chicago and the surrounding country are on exhibit and even some of the larger plants of other sections of the country are there.

The Largest Paper Machine in the World at Iroquois Falls

The largest paper machine in the world is now making paper.

No. 7 started Monday, June 27, and ran easily from the very start.

When the Abitibi Company started up Number one machine in October, 1915, it was then the largest paper machine in existence, being 202" wide; made by Walmsleys.

Some three years ago, the Pacific Mills Company at Ocean Falls, B. C., commenced operating two two hundred and four inch machines, made by the Bagley and Sewall Company of Watertown, N. Y. The two new machines at Iroquois Falls surpass them all; Number seven is now running and Number six will be ready in two or three weeks. They are two hundred and thirty-two inches wide and were built by Charles Walmsley & Co. Ltd., of Bury, Lancashire, England.

Number six machine is electric driven, but Number seven is driven by a five hundred horsepower Bellis-Morcom Vertical Engine, also English built, being manufactured at Birmingham, England. The power is transmitted through belt and rope trains.

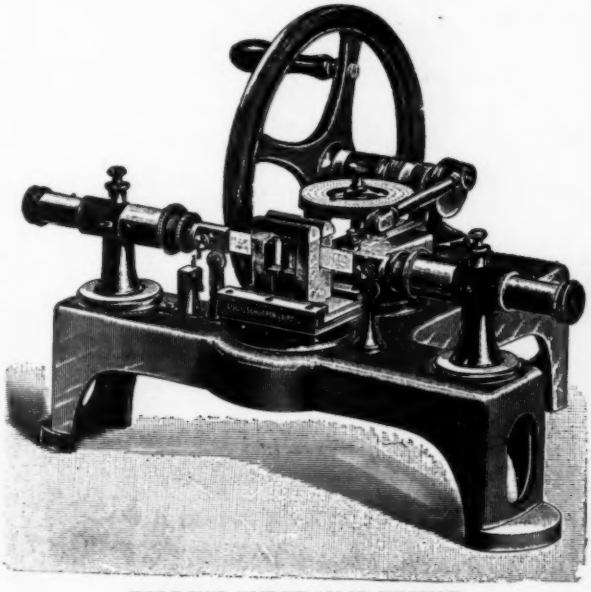
This machine when running to capacity will make a sheet of paper over eighteen feet wide and two hundred miles long every working day. The pulpwood from fourteen acres will be required to "feed her" every day of the year. This machine will turn out eighty-five tons of newsprint per day, equal to over one million copies of the "Cobalt Nugget" every twenty-four hours. Imagine a sheet of paper eighteen feet wide, stretching from Cobalt to North Bay and back, and you have some idea of the paper turned out daily by this giant machine.

The starting up of this machine marks a new era in the size of paper machines and is a tribute to the daring resourcefulness and initiative of the pioneer paper company of the North.

The raw material to supply this huge machine with stock will come from the present Sulphite Mill and the present and extended Groundwood Mill, whilst new boiler and steam generating equipment have been installed to provide the necessary power for drying the paper and driving the machine. The electric energy for running screens, pumps, deckers, grinders, etc. etc. will come from the newpower station at Twin Falls.—The Broke Hustler, July 5, 1921.

SCHOPPER
Standard Paper Testers
—are the Best

STRENGTH AND STRETCH TESTER



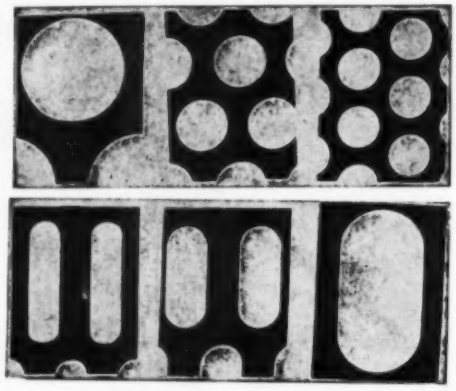
FOLDING ENDURANCE TESTER

Sole Agents

FOREIGN PAPER MILLS, Inc.

261 Broadway, New York

Perforated Metal Screens



Of Copper, Brass, Steel, Bronze, or Any Other Metal

Perforations of All Sizes and Shapes for Use in Pulp and Paper Mills in

Centrifugal Screens, Drainer-Bottoms, Filter Plates, Pulp Washers, Suction Box Covers, Etc.

Accuracy in all details and excellence of quality at lowest consistent prices

The Harrington & King Perforating Co.

615 North Union Avenue CHICAGO, ILLINOIS, U. S. A

NEW YORK OFFICE, 114 LIBERTY STREET

BROWN-WALES CO. sELAw IRON & STEEL

"Headquarters in New England" for Half a Century

For everything in iron, steel and kindred materials—either for building, repairing, or manufacturing purposes—buyers have been coming to "Headquarters in New England" for over fifty years.

For these many years we have endeavored, in every transaction—no matter how small the order—to give every customer the fair prices, and that quicker delivery service for which "Selaw" has long been known. It will pay you to have at hand for future buying our handbook on all lines and stocks carried. Send for it. It's free.

Distributor for ARMCO Iron and Products

BROWN-WALES CO.

Boston 9, Mass.

Perforated Metal Screens

in all metals for pulp and paper mills

Elevator Buckets (Plain and Perforated)

Conveyor Flights and Trough

General Sheet and Light Structural Work

Write for perforated metal handbook

Hendrick Mfg. Company

Main Office & Works 51 Dundaff Street Carbondale, Penna.

39 Church Street New York City

915-916 Union Bank Building Pittsburgh, Penna.

Are your handling costs eating into profits?

GIVE your machine operators *labor-saving* helpers—the kind that work for practically nothing per week.

The Yale Spur-Geared Block and I-Beam Trolley System, pictured above, is used for lifting heavy pipe and swinging it into position on the threading and cutting-off machines. One man does it all without a helper, easily and quickly. This is the Yale Way.

Other units of the Yale Hoisting and Conveying System include Screw-Geared and Differential Chain Blocks, Electric Hoists, Electric Industrial Trucks, Tractors, and Trailers. Write for further information about the Yale Way.

Yale Made is Yale Marked

The Yale & Towne Mfg. Co.

Makers of Yale Products: Locks, Hoists and Electric Industrial Trucks.

Stamford, Conn. U. S. A.

YALE Hoisting and Conveying Systems

Industry Thriving in Austria

While the paper industry of Austria has been hurt during the transition period it has not suffered so severely as many other lines, according to reports to the Bureau of Foreign Commerce at Washington. Under the Treaty of St. Germain the Republic of Austria retains the greatest part of its paper industries and its supplies of wood.

A large part of the country is wooded and importations of coal have been less of a factor than in the majority of industries, as water power is used largely, coal entering into production only for drying the pulp. There are 132 wood pulp mills in the country, five cellulose factories, six rag pulp factories, nineteen plants devoted exclusively to paper making and thirty-two plants which produce pulp.

Of the prewar territory there remains 58.5 per cent of the paper production, 62.5 per cent of the paper board industry, 53.9 per cent of the cellulose manufactures and 70 per cent of its pulp production. Present plant capacity is about 180,000 tons of paper, 122,000 tons of cellulose, 100,000 tons of wood pulp and 80,000 tons of paper board annually. The industry is working now at about 75 per cent of capacity.

Paper Making Industry in Poland

In January, 1921, there were twelve paper mills in operation in Poland. Of these, eight were in Congress Poland, employing about 3,000 workmen; two in Galicia, with 700 workmen; one at Bielsk, in Teschen Silesia, with 250 workmen, and one, the newly established Posnanian Paper Mill, at Bromberg (Bydgoszcz), in Posen, employing 200 workmen.

The total number of workmen—4,000—is but slightly less than were employed in 1913 in Congress Poland alone; but their output does not reach the same level owing to reduced productivity of workmen and want of coal.

The irregular supply of fuel causes frequent temporary suspensions of work and subsequent increases in the price of paper, full wages being paid to the workmen during these periods of enforced idleness.

Big Alaska Pulp Wood Sale

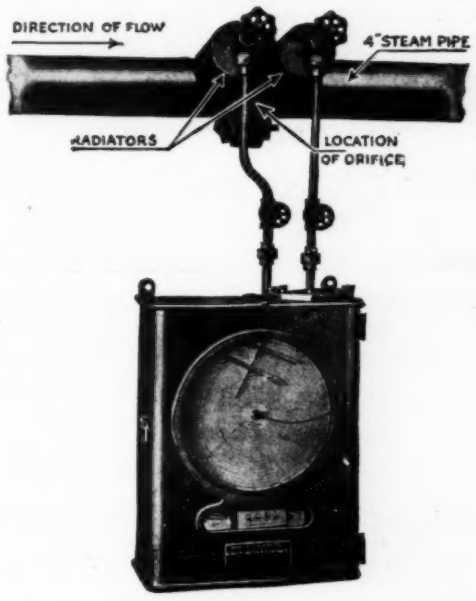
The Federal Government has sold a million cords of pulp wood from the Tongass National Forest in Alaska to the Alaskan-American Paper Corporation. About twenty per cent of the wood is spruce, 66 per cent hemlock and 14 red cedar. The concern has 32 years in which to complete its cutting and is being encouraged to develop electric power near by.

It is estimated that the Alaskan forests comprise a hundred million cords of wood suitable for making paper, and that under scientific management can produce two million cords annually for an indefinite time. It is further believed that 250,000 horse power may be developed on the waters within this forest reservation. It is the policy of the Government to encourage this development. While good authorities assert that there are in this country inexhaustible supplies of material other than wood from which paper may be made it would seem that the necessity for its use is far from being immediate.

Alaska Pulp and Paper Company has sent out samples of the first pulp produced on the Steel River. The mill is entirely operated by electricity and is the first of its kind in Alaska with a 20-ton a day capacity. Sufficient electric power is available for a considerable increase in production and raw material is available in almost unlimited quantity.

The Australian House of Representatives has passed a bill exempting British newsprint paper from duty. It has, however, placed a duty of 3 pounds a ton on newsprint from other countries.

Bailey Fluid Meter



PRACTICAL —— ACCURATE

This shows the Bailey Fluid Meter complete for the measurement of steam. It consists of the Monel metal orifice installed between a pair of flanges, radiators and valves tapped into the pipe on the inlet and outlet sides of the orifice and pipes connecting these to the recorder.

Bailey Fluid Meters are easily and cheaply installed as changes in piping are not required and the accuracy is guaranteed.

They are the most practical and satisfactory meters for recording and integrating the flow of steam to turbines, digesters, paper machines and other processes. Steam can be measured at any pressure and temperature, exhaust steam included.

Either pressure or temperature recorders, or both, may be added to record on the same chart as the rate of flow.

Our engineering department is ready to suggest the proper equipment for your service.

The BAILEY METER COMPANY
2023 East 46th Street, CLEVELAND, OHIO

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Industrial Engineer
Wisconsin Rapids, Wisconsin
Paper, Chemical and Ground Wood Mills, Hydro Electric and Steam Power Plants, Surveys, Estimates, Appraisals and Reports.

James L. Carey
Paper Mill Architect and Engineer
208 N. Laramie Ave., Chicago, Ill.

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PAPER, PULP AND FIBRE MILLS INCLUDING BUILDINGS AND COMPLETE MECHANICAL EQUIPMENT
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STEAM PLANTS
Examinations, Reports, Estimates of Cost, Designs, Specifications, Valuations

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Consulting Engineer
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Engineering Service for Paper Mills
Construction and Production
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Special Sulphite Mill Equipping
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Wanted
Experienced man to take charge of Cylinder Machine on liner and filler board. 40 tons daily capacity. Apply, giving full particulars, to Box 28, Paper Industry, 356 Monadnock Block, Chicago, Ill.

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Do You Know That
Claflin Continuous Beaters
Have 3½ times the efficiency of other beaters in use today for Beating, Brushing and Refining Paper Stock?
For Increased Production, Greater Economy, Stronger, Finer, More Uniform Pulp, the CLAFLIN CONTINUOUS BEATERS will more than satisfy.
Ask Us for Our New Catalogue
THE CLAFLIN ENGINEERING COMPANY
LANCASTER, OHIO
The Canadian Fairbanks-Morse Company, Limited
Agents for Dominion of Canada.

Looking to South for Pulp Woods

Establishment of paper mills in the southern states is all that is needed to utilize much southern pine for manufacture of book paper, the Forest Products Laboratory here announces.

Its experiments are said to have determined that pulp made from one variety of pine is suitable for this purpose.

Southern pine has often been suggested as a possible supply of material for pulp purposes, but experiments met with failure until the laboratory, working with loblolly pine, successfully turned out book paper by the sulphite process.

Further experiments will be made here with other varieties of southern pine to determine whether they will be equally adaptable to manufacture of pulp.

What work has been done with other woods from the south —black and tupelo gum, swamp maple and other like material—shows that they are all substantially as well suited for the purpose as the loblolly pine and the red gum.

To Concentrate Truck Repair Work

In order to concentrate the repair work upon the trucks and tractors used by its spruce wood department the Great Northern Paper Company has commenced construction upon a large shop at Greenville Junction, Maine, which as soon as completed will be the center for repairs upon the entire motor equipment of the company. At the present time the grading of the site, located a short distance west of the B. & A. station, is going on and with its completion the construction of the building will be commenced and pushed to completion, so that the shop may be ready for occupancy in the fall.

The shop is to be one of large dimensions, of one story and a basement and will be of reinforced concrete construction and fire-proof throughout. Walls and floors are to be of concrete with a wood block finish for the floor proper. The building will measure 218 by 102 feet and will be divided into a general repair shop, 168 by 100 feet, a spare parts room, 50 by 25 feet, and an office, 25 by 16 feet. It will also be equipped with toilet and locker rooms.

Go with Mac Sim Bar Paper Co.

Three more former employes of the Eddy Paper Company, of Three Rivers, Mich., have taken responsible positions with the Mac Sim Bar Paper Company at Otsego, of which company Charles E. Nelson is now president and general manager.

Sidney M. Phelan, Jr., has taken the position of assistant general manager and sales manager of the Mac Sim Bar Company. Mr. Phelan for the past five years has been assistant general manager of the Eddy Paper Company and is an experienced paper manufacturer.

Previous to going to Three Rivers he was connected with the Graham Paper Company at St. Louis where he held a responsible position. His brother, Balfour Phelan, also joins the sales force of the Mac Sim Bar company.

L. W. Dickinson, who has been connected with the Eddy Paper Company since 1912 as office manager, has also taken a similar position with the Otsego Company.

Official notice of the passing of the Boehme & Rauch company and the Monroe Binder Board company, two Monroe paper manufacturing concerns, has been received from the office of the secretary of state, Lansing, Mich. They have dissolved and been combined in the Consolidated Paper company.

The manufacture of paper, especially newsprint paper, from Alabama spruce pine growing in this state, is proposed by Birmingham manufacturers and capitalists.

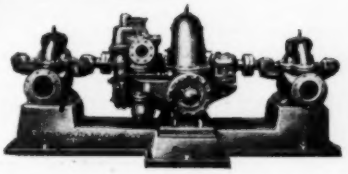
STANDARD BLEACHING POWDER

Manufactured by

Pennsylvania Salt M'f'g Co.
PHILADELPHIA, PA.

EARLE CENTRIFUGAL PUMPS

For Service Where Quality Counts



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4711 Stenton Ave., Philadelphia, U. S. A.

BUILD NOW

The history of American business development shows that its remarkable progress is due largely to the courage, foresight, boldness, and broadness of vision of our leaders.

Such qualities were never needed more than they are today.

If we are to pay our huge war bills, develop our domestic markets and take a place among the large trading nations of the world, we must multiply our production many times.

In order to do this we must have greatly increased manufacturing and trading facilities.

Let us not pay too much attention to prices but rather give heed to the great need.

Ranger Built Is Well Built

Casper Ranger Construction Co.
Main Office, HOLYOKE, MASS.
BRANCH OFFICES
Springfield, Mass. New York, N. Y.
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KNOW WHAT YOUR COAL BILL SHOULD BE

There's no longer any such commodity as "Cheap Coal," and indications are that there probably never will be again. At present prices, or for that matter—at *any price*—it is neither good engineering practice nor good management to check your coal by mine weights or railroad weights.

RELIANCE WEIGHING MACHINES

insure an *accurate* and *positive* check on every ounce of coal consumed. They provide a means, without additional labor cost, of checking the total received against the total purchased. They show to operator and executive the exact amount of coal consumed by each boiler. They bring efficiency and economy into coal consumption.

Weighs—records—indicates—without manual effort—the entire operation automatic.

Each machine is a unit in itself, so perfect in design and flexible in application that it will meet any existing plant conditions.

The services of our engineers are at your command in helping you plan prospective installations.

Write us for details.

RELIANCE WEIGHING MACHINE CO.

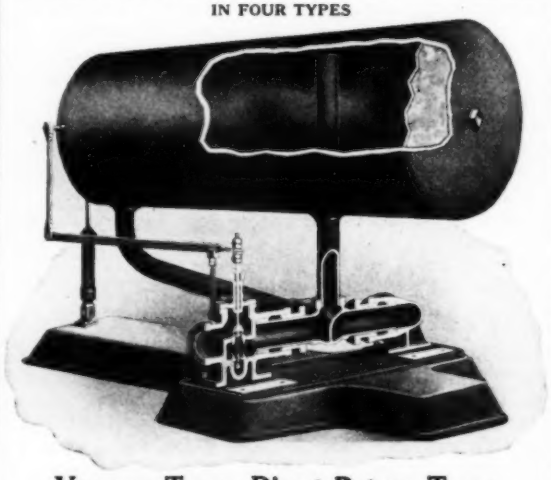
General Offices and Factory

LUDINGTON, MICHIGAN

Representatives in principal cities United States and Canada

The ELLIS AUTOMATIC TILTING STEAM TRAP

IN FOUR TYPES



Vacuum Traps, Direct Return Traps
Lifting Traps, Separating Traps

ESPECIALLY ADAPTED FOR PAPER MILL USES

The best trap made to remove the steam condensation from paper machine dryers. Works on a new and improved principle different from any other trap on the market.

Let us send you further information

THE ELLIS DRIER COMPANY

332 South LaSalle Street Chicago, Ill.

Smith Hydraulic Turbines

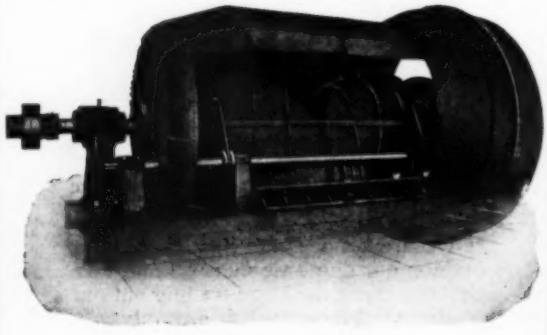


Illustration shows horizontal unit developing 2,400 horsepower under 42 feet head, at

88% EFFICIENCY

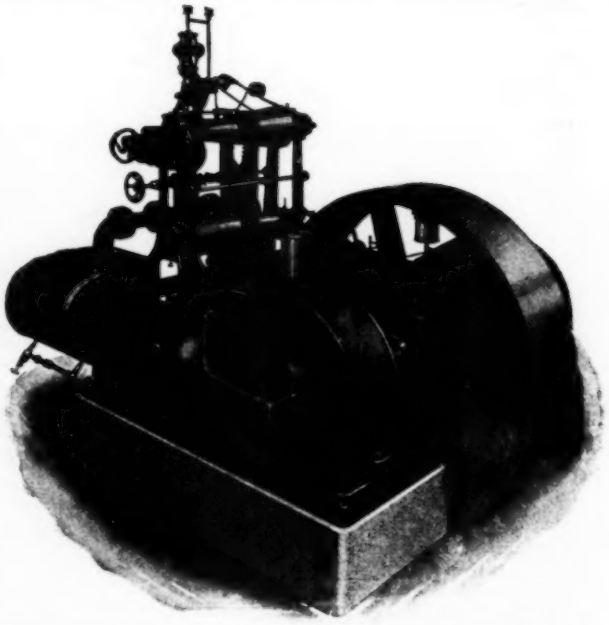
installed at Glens Falls, N. Y., Mill of International Paper Co.

Write Dept. "S" for Illustrated Bulletin

S. MORGAN SMITH CO., York, Pa.

Branch Offices:

BOSTON 176 Federal St. | CHICAGO 76 W. Monroe St. | MONTREAL 485 Power Bldg.



Variable Speed Engine

The engine illustrated above is especially designed to drive paper machines, giving continuous and reliable service. A patented safety device protects your employees and plant.

THE BROWNELL CO., Dayton, Ohio

SEND FOR BULLETIN E-4

New Bag Machines

Machines for the manufacture of "paper bags in rolls," a simple invention which promises to revolutionize the paper bag industry, are to be made in Elgin, Ill., for the Standard Paper Bag Company of Chicago.

Contract for the making of the first machine has been made with the Charles J. Moody Company. Following the completion of the machine and a demonstration before paper bag manufacturers of the country, who at the present time are seeking control of the patents, it is planned to turn out hundreds of the machines which are to be leased to bag-makers.

Strawboard Concerns Merged

The Piqua, Ohio, division of the American Straw Board Company has been purchased by the Piqua Straw Board Company, a new concern, of which C. H. Palmer is president. The purchase includes the mill of the American Straw Board Company at Tippecanoe City, Ohio, and the Queen City Paper Company, an Ohio corporation, formerly owned by the American Straw Board Company. General offices of the new company are located in Akron, Ohio.

As a direct result of the success of the Trinity Paper Mills Company in making paper pulp from cotton seed linters at its new plant at Commerce, Tex., preparations are being made for the establishment of similar plants at McKinney and Fort Worth, and the construction of a 60-ton plant in Dallas for the manufacture of the finished paper from the pulp. The pump plants at McKinney and Fort Worth will each be of twenty tons' capacity, which is the same as the one at Commerce.

The big $2,000,000 power plant of the St. Regis Paper Company, Watertown, N. Y., at Black River, has reached a degree of completion which permitted the turning on of the water in the canal and the turning of the first unit power wheel some days ago. The first of three units has been completed and placed in operation, and it is expected that within 60 days the other units will have been finished.

Both machines at the new Niagara mill of the Kimberley-Clark Company have been put to making news print, owing to the fact that book paper orders are scarce. Some print has been manufactured for the past six weeks or so, and the present increase is not an extensive change. It will only be of temporary duration.

An announcement by the Beaver Board Companies, with main offices in Buffalo, N. Y., states that at a recent meeting of the Board of directors General C. C. Jamieson, vice president of the George W. Goethals Company, Inc., was elected chairman of the board of directors in full charge of the management of the companies.

The Newton Falls Paper Company will open its plant at Newton Falls on or about September 15 on the exclusive manufacture of book paper. The work of converting the plant from wrapping and specialties paper is now rapidly approaching perfection and the new owners will soon obtain their paper supply from this mill.

The American Wringer Co. have moved their general offices from New York City to Woonsocket, R. I. Their sales offices will continue to remain at 99 Chambers street, New York City; 319-321 West Randolph street, Chicago, and 718 Mission street, San Francisco, Cal.

Colors for Paper

We offer a complete line of Acid, Basic and Direct Colors in a variety of Shades suitable for all grades of paper.

Acid Violet
Acid Bordeaux B
Delaware Fast Red
Delaware Croceine Scarlet M O O
Delaware Orange Y
Delaware Croceine Orange
Delaware Eosine

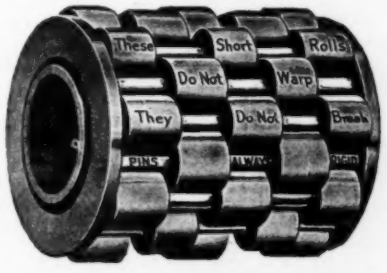
Auramine
Victoria Blue
Methylene Blue O
Bismarck Brown
Malachite Green
Rhodamine B Extra
Methyl Violet

Benzopurpurine 4 B Concentrated
Direct Yellow
Congo Red

Samples matched in our Laboratory

A. Klipstein & Company
644 Greenwich Street NEW YORK CITY

Correct Design in the Hart **Staggered** Roller Bearing, demands a **Staunch** construction of Roll Cages

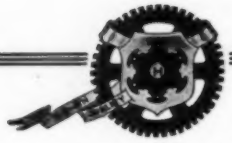


Rolls or Races do **Not** Crumble or flake off as ball bearings

"The Quality" BEARING ,, Has **Greater** Capacity and **Longer** Life

One grade only—the **Best** Design, Material, Workmanship

The HART ROLLER BEARING CO.
Radial and Thrust Types ORANGE, N. J.



Friction Clutch Engineers

The big, broad field of engineering is made up of those who have made a specialty of some particular branch.

The Hill Clutch Company's engineers have made a study of the design and application of friction clutches for a period of 37 years. Whenever you wish to consider friction clutches—and you probably have need of some in connection with your line shaft equipment or on individual machines, which you have never thought of—consult us.

You will be placed under no obligation in receiving our recommendations and quotations covering your contemplated requirements.

Our Catalog No. 8 contains a lot of clutch data well worth having handy for reference. Copy will be mailed upon request.

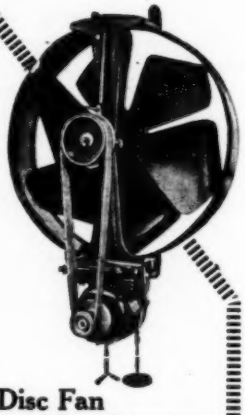
THE HILL CLUTCH CO.

General Offices and Plant CLEVELAND, OHIO
NEW YORK OFFICE: 50 CHURCH ST.

A New

Bayley

Product



IN THE FORM OF a light and easily installed disc ventilating fan, made in sizes varying from 20" to 48" is hereby introduced to the ventilating trade, in the

Bayley Junior Disc Fan

The Bayley Junior has specially shaped floats designed to move a maximum volume of air with a minimum of power. It is simple in construction, has few moving parts and is equipped with ball bearings throughout.

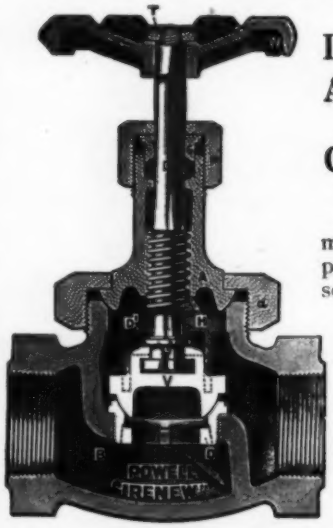
The Bayley Junior can be furnished for either line shaft drive or with individual motor drive with a speed variation of from 2½% to 100% of maximum speed. This variation is accomplished by a patented belt tension arrangement that permits the use of a standard constant speed motor, thus eliminating the expensive and troublesome variable speed motors used on ordinary variable speed fans.

Write for Bulletin Today

Bayley Manufacturing Company
Dept. B
MILWAUKEE, WIS.

Powell "IRENEW" Valve

ALL PARTS RENEWABLE



Irenew Globe Angle, Cross OR Check Valves

Iron body, brass mounted; acid-proof discs and seat rings.

Screwed or flanged ends.

If your dealer cannot furnish you with Powell "IRENEW" Valves write us.

THE WM. POWELL CO.

DEPENDABLE ENGINEERING SPECIALTIES.

CINCINNATI, O.

The Davis Regulator for Paper Mills

One of the Davis Valve Specialties that has been used with such great success in so many of the country's largest paper mills is the Davis Regulator. It automatically reduces steam, water, air or oil from any initial pressure to any desired delivery pressure. And it does its work accurately, dependably, without care or attention—all Davis characteristics.

The 72-page Davis catalog describes all Davis equipment. Write the G. M. Davis Regulator Co., 414 Milwaukee Avenue, Chicago.

DAVIS VALVE
STEAM SAVERS SINCE 1875
SPECIALTIES

Fenska Joins New York State College

Prof. R. R. Fenska has resigned as assistant professor in forestry at the University of Montana to become professor of forest engineering at the New York State College of Forestry, Syracuse university.

Professor Fenska is well equipped for his profession. He spent his early years in the pine forests of Wisconsin, where his father was a pioneer lumberman, thus gaining much valuable practical experience in forestry before entering college. He was graduated from Beloit in 1911 and from the Yale forestry school in 1913.

He served two years as forester's assistant on the Wisconsin state board of forestry and instructor of forestry at the University of Wisconsin, where he carried on work at the United States Forest Products Laboratory.

A New Paper Mill Manager

Cards have been received announcing the arrival of David Clark Everest, Jr., at the home of Mr. and Mrs. David Clark Everest, in Wausau, Wis., July 18, 1921.

News Personals

The Parsons Trading Company, of 17 Battery Place, New York, announces that M. Sone, formerly with this company for 10 years and recently with the New York Oversea Company, has rejoined it and is in charge of its wood pulp importing department.

Wm. P. Tidwell has been appointed temporary secretary of the American Paper & Pulp Mill Superintendents' Association, and offices have been opened at 10 Regent Theater building, Kalamazoo, Mich.

George M. McCarthy has been transferred from the Eastern sales organization of the American Writing Paper Company to the Chicago territory, where he will be associated with A. Carey Huls, manager of the Chicago office of the company.

E. C. Martin, of Toronto, Can., formerly with the Scott Paper Company, has joined the selling staff of the Interlake Tissue Mills Company, and is devoting special attention to the new interfolded towels which have just been placed on the market by the latter concern.

J. C. Mallalieu, president of George W. Millar & Company, paper merchants of New York, has been appointed a member of the Statistical Committee of the National Paper Trade Association, of which Charters K. Higgins, assistant secretary of the association, is chairman. C. H. Morian, of Philadelphia, is the third member of the committee.

F. Henry Savage, formerly in charge of the Boston sales force of the American Writing Paper Company, has been transferred to the papeterie section of the sales department and will call on converters west of New York City.

J. A. Moffitt, with offices in the Oxford Building, Chicago, has been appointed American representative for Henry Knuck & Company, of Dundee, Scotland, dealers in and exporters of jute and flax waste and other paper-making materials.

In its new building at Dominick and Clark streets, New York City, the Continental Paper & Bag Mills have set aside a room for the use of visiting members of the trade, and to those from out of town a cordial invitation is extended to make the guest room their headquarters during their stays in New York. To make the offer even more generous the company has provided a private desk compartment for visitors' papers and will supply a stenographer.

WHITAR
TRADE MARK REG. U.S. PAT. OFF.
News Blue
Auramine

We Supply a Complete Line of

Aniline *and* Pigment Colors

for Paper Makers

SPECIAL SHADES OF COLORED PAPER OR SAMPLES OF DYESTUFF MATCHED AND COMPLETE FORMULAS FURNISHED

The White Tar Aniline Corporation
56 Vesey Street, New York City
Works: Kearny, New Jersey

THE NEWPORT COLORS *for Paper*

Newport Acid Bordeaux B Conc.
and
Newport Paper Red 2 B

Two products of good coloring power for both lighter and deep shades.

NEWPORT
TRADE MARK
"COAL TO DYESTUFF"

Newport Chemical Works, Inc.
Passaic, New Jersey
Branch Sales Offices
Boston, Philadelphia, Greensboro, N. C., Chicago
Providence

WYCKOFF WOOD PIPE

PRESSURE PIPE THAT NEVER BURSTS.
Built in sizes 1 inch to 48 inches.

The Paper Industry is successfully using thousands of feet of this Pipe and they find it to be the best conveyance for Paper Stock and Acids that can be obtained.

The Pipe of Service

DURABLE—ECONOMICAL—EASY TO INSTALL

Built of selected Canadian White Pine, Wyckoff Wood Pipe is wound with steel bands whose tensile strength is 58,000 to 65,000 lbs. per square inch. The experienced engineer selects a pipe of proven dependability. Wyckoff Wood Pipe, during the past 65 years, has built a reputation that stands the keenest competition. It has been, during this time, the choice of the largest pipe users in the world. We also manufacture a high grade underground steam pipe casing.

Write today for catalog and prices

A. Wyckoff & Son Company

1855 Elmira, N. Y., U. S. A. 1920

Guaranteed Perfect

Draper Hollow Balanced Brass Balls

FOR STUFF PUMPS

Absolutely balanced; will not pound out of shape

Specify these when ordering new pumps.

Order these to replace worn-out balls.

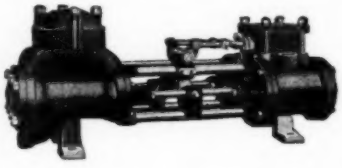
We also manufacture—

SOLID BRASS BALLS
IRON AND STEEL BALLS
BALL CHECK VALVES
VALVE FACING TOOLS

The Draper Manufacturing Co.

Port Huron, Mich. Petrolea, Canada

Every ball bears our registered trade-mark



Dean Bros. Durable Duplex Steam Pump Will Not Short Stroke

The steam cylinders on the Durable Duplex Pumps have half as many ports as are found on the old fashioned duplex pump. Single ports are made possible by the use of Dean Bros. patented Durable valve movement. This method of construction produces a very noticeable economy in steam consumption and is only one of the many advantages which have placed these pumps far ahead of any other duplex steam pump now manufactured.

Send For Catalog No. 127

New York Sales Office, 141 Broadway

DEAN BROS. STEAM PUMP WORKS. INDIANAPOLIS.

RETURN TUBULAR LOCOMOTIVE **BOILERS** WATER TUBE SCOTCH MARINE

A LARGE STOCK OF HIGH-GRADE BOILERS OF PRACTICALLY ALL SIZES, TYPES AND MAKES, TAKEN OVER FROM DU PONT CHEMICAL COMPANY'S AND OTHER PLANTS WITH PRODUCTION RECORDS — RECONDITIONED, OFFERED SUBJECT TO ANY INSPECTION, AVAILABLE NOW!

"SAVE TIME AND MONEY ON YOUR POWER INSTALLATION — LET DAVIS FURNISH THE BOILERS"

LONG DISTANCE TELEPHONE
RANDOLPH 2233

J. F. DAVIS

1122-1123-1124 HARRIS TRUST BUILDING
CHICAGO, ILL.

Vance McCarty Now with the Chicago Belting Co.

Mr. Vance McCarty, one of the most prominent men in the leather belting industry, has been elected vice president of the Chicago Belting Company. He leaves the Edward R. Ladew Company, a subsidiary of the Graton & Knight Mfg. Company, where he was vice president.

Mr. McCarty has been brought up in the leather belting industry, the first six of his twenty-two years' experience in this field being spent in the virious departments of the manufacturing end of the business. For the last sixteen years, he has been associated largely with sales work, where his intimate knowledge of manufacturing conditions, as related to consumers' requirements from an economical viewpoint, proved invaluable to him. Although Mr. McCarty is an authority on all subjects connected with the manufacture of leather belting, it was as a salesman that he established his most enviable record. He has built up a record for individual sales of belting which has never been equaled in this country. Mr. McCarty is very well known to many paper manufacturers.

A New Link-Belt Book on Belt Conveyors

A new book on Belt Conveyors has just been published by the Link-Belt Company of Chicago, Philadelphia and Indianapolis. It is book No. 215. It fully describes the Uniroll and Multiroll Idlers recommended by this company. Among the interesting features of the book are:

1. The correct methods of figuring belt conveyors and the details entering into them.
2. Price lists which will enable the user to determine the cost of a complete conveyor or any portion of a conveyor.
3. Numerous examples suggesting the correct types of belt conveyors for the handling of bituminous coal, by-product coke, sand and gravel, bagged sugar or similar material, crushed rock, etc.
4. In addition there are many illustrations of typical installations.

This book should be a valuable addition to any library, and will be sent by the Link-Belt Company to anyone interested in this subject.

This company has also just issued a new link belt chain data book, in which are presented the heavier rugged steel chains used for power transmission, including also elevating and conveying chains.

The Cochrane Steam Specialty Company of Massachusetts has been organized to represent in New England a number of well-known manufacturers of power plant equipment, including the H. S. B. W. Cochrane Corporation, manufacturers of feed water heaters, steam and oil separators, V-notch meters and metering heaters, hot and cold process water softeners, flow meters, precision meters, weighing meters, multiport valves and multiport drainers, also the Steam Motors Company, Inc., manufacturers of steam turbines for driving generators, pumps, fans, etc., and the D. Connelly Boiler Company, builders of water tube steam boilers. The office, which is in charge of Mr. Elliott Greene, who has long been connected with the several lines mentioned, is located at 1045 Oliver building, Boston, Mass.

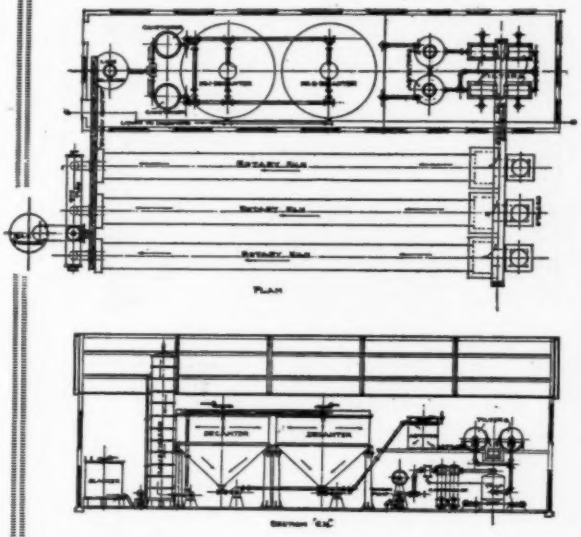
The Combustion Engineering Corp., of New York, are sending out a new booklet entitled "The Use of Powdered Coal Under Steam Boilers." The subject matter was used as an address before the American Iron and Steel Institute. It is perhaps the most complete summary of powdered coal progress that has ever been issued. Copies can be had for the asking, and should be in the hands of every large power user.

The Foley Paper Mills, of Rochester, N. Y., have filed notice of an increase in capital from $25,000 to $50,000.

Continuous Causticizing with Lime Recovery and Reuse

OUR apparatus is built for the specific purposes indicated in the above title. It is the work of our consulting engineer, who for nearly twenty-five years was general manager and chief designing engineer of one of the large alkali plants in this country. The apparatus has been in successful operation for some seven years, and is highly efficient, both as regards economy in the use of raw material, and saving in labor.

The complete plant which we furnish, consists, as indicated in the sketch, of a continuous causticizer, decanter, rotary filter, rotary kiln, gas producer, lime slaker and auxiliary apparatus such as vacuum pump, lime and liquor pumps and sludge agitator. All apparatus work continuously. The causticizer is heated with exhaust steam, and supplied continuously, by means of pumps, with calcium hydrate and sodium



carbonate in the proper proportions. The continuous discharge of caustic liquor and lime sludge is delivered by pumps to the decanters, the clear caustic drawn from the top and the mud from the bottom; delivered by pump direct to the sludge agitator from whence it flows to the filters. The dried filter cake is delivered by belt to rotary kilns fired with gas, from whence the recovered lime is returned to the slaker to be used again.

With good grade of lime, 90% of the sludge can be recovered. The alkali loss is with careful working, almost nil. All of the apparatus is of heavy construction, and specially designed for the work. The process being continuous the steam consumption is much less than that of the batch process, moreover the process does not require live steam, exhaust at 10 pounds pressure being ample to operate at maximum capacity.

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Lynchburg, Va., U. S. A.

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Scientific analysis shows this stone to contain every requisite for an ideal pulp grinder. Hard, sharp, semi-angular grains cemented by an open medium soft matrix.

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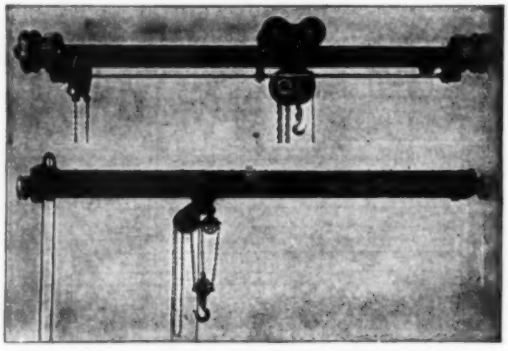

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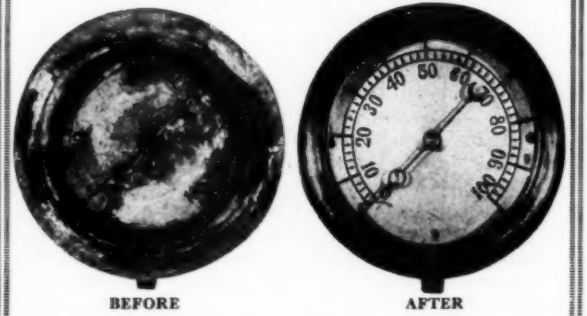

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REGARDLESS OF WHO MANUFACTURED YOUR GAUGES, Regardless of their CONDITION, we GUARANTEE to put them in First Class Working Condition

We request you to send one gauge to be repaired—no charge—as a sample of the quality and delivery of our work.
Immediate delivery of work that is uniformly excellent, at a satisfactory cost.

The Manning Gauge Company, Inc.
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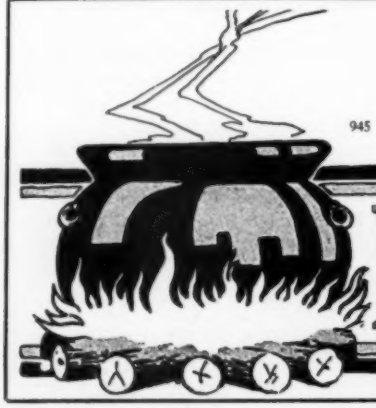

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SWENSON EVAPORATORS

Uncle Sam Gets New York Forester

Edward F. McCarthy, first forester in the faculty of the New York College of Forestry at Syracuse, has been given an important new position in the United States Forest Service, being assigned to a new forest experiment station being established at Asheville, N. C. He will rank next to the director of the station, one of the old forest service officials, and the taking of a man from outside the service for so important a position is somewhat unusual.

The work to be done at the new station will be along the lines where Mr. McCarthy has been doing his best work, investigations of forest growth. He was the first forester in the faculty of the Syracuse college, but left the faculty, where he was head of the department of utilization, when Dean Moon succeeded Dr. Hugh P. Baker. He went to Canada to make studies of pulp wood growth in the Algoma district, north of Lake Superior, and the results of his studies were a feature of the national convention of the Woodlands Section of the American Paper and Pulp Association this Spring.

The attention called to his work by this report aided materially in his being placed with the United States Forest Service.

New Paper Mill at Joliet, Ill.

The Eagle Paper Company, capitalized at $350,000, according to its directors, and employing 70 men, began operation at Joliet, Ill., on Monday morning, August 1, 1921. They manufacture wrapping paper and hangings.

H. E. Roether and D. W. Ramsay, both of Joliet, are general manager and superintendent respectively of the paper mill. Directors are Chicago men and most of the capital has been subscribed by Chicago men.

Directors of the industry are J. Charles Maddison, president, T. D. Adams, secretary, and E. H. Camphausen, treasurer.

The Weller Mfg. Co., of Chicago, has just issued a handsome booklet describing a very complete line of spiral conveyors manufactured by them. It contains much valuable information to anyone interested in this class of machinery.

The offices of the Union Sulphur Company have been moved to a new building constructed by the company and named the Frasch building, in honor of Herman Frasch, founder of the company. The new address is 33 Rector street.

The Conveyors Corporation of America, of Chicago, has sent out a little booklet, "The Proof of the Pudding," giving the opinions of many users of steam jet conveyors on this method of handling ashes.

Plans to build a new wood pulp storage plant at Wisconsin Rapids have been announced by the Consolidated Water Power & Paper Company. The building will probably be finished by September and will have a capacity of many tons.

A loss that is said to total approximately $10,000 was sustained recently when fire broke out in the resin sizing department of the Western Paper Makers' Chemical Company's plant at Kalamazoo, Mich.

A. F. Zacher has resigned as district manager of the Buffalo office of Economy Fuse and Mfg. Company, of Chicago.

WINDERS and REWINDERS
SAMUEL M. LANGSTON COMPANY
CAMDEN, N. J.

INVINCIBLE PAPER & PULP CORPORATION
Agents for
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FOREIGN AND DOMESTIC
PAPER MAKERS' SUPPLIES
CHEMICAL AND MECHANICAL PULPS
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Hamilton Top Felts
run until worn out, with less trouble of "picking" on machine than any other make of top felts can show. A trial is invited
SHULER & BENNINGHOFEN
HAMILTON, OHIO

Fitchburg Duck Mills
ESTABLISHED 1844
FITCHBURG, MASS.
MANUFACTURERS OF
STANDARD AND MULTIPLE
DRYER FELTS
English Weave in Two, Three, Four, Five and Six Ply—60 Inches to 176 Inches in Width
Fine Faced Felts for Fine Papers. Absolutely no felt marks in paper. TRIBUNE Three Ply Felts for Coarse Papers.

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Machine Finish Writings

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Hinde & Dauch Paper Co.

Corrugated Fibre Shipping Boxes and Packing Materials of Acknowledged Superiority

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WOLVERINE Paper Company

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Best Quality

Waxed Tissue a Specialty

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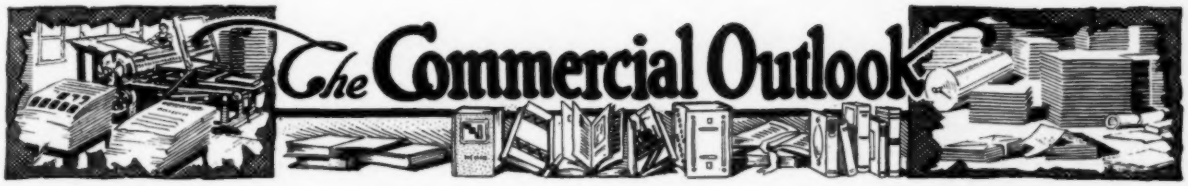

THE paper industry is commencing to show at least some signs of a reawakening. On the whole demand is still of very narrow scope; there are few buyers as yet absorbing other than supplies immediately needed, and the quietness obtaining in most consuming trades obviously keeps requirements down to close to a minimum, but there is nevertheless a revival of inquiry for some kinds of paper which is creative of a better feeling in the trade and tends to make for a steadier price tone.

Consumers as a general thing are still waiting for improvement in their own line before resuming the purchase of paper on a normal scale. In some instances, the question of price is causing buyers to hold off, but it can be stated that insofar as the situation as a whole is concerned, price plays but a minor part in keeping buyers out of the market at present. The salient reason for this is that paper prices, with some few exceptions, are fairly well stabilized on levels comparing quite favorably with those considered as normal before the war. Prices are still substantially above pre-war levels, but this of course is to be expected, because the new normal average price basis on paper as well as on practically all manufactured commodities must necessarily be a good deal higher than it was prior to the war.

The real reason why demand for paper is slow today is that consumers are not using usual amounts of paper. If there was greater need for paper there is no question that consumers would readily pay prevailing prices. This seems proven by the fact that even before requirements have increased, consumers are freely inquiring concerning forward deliveries, indicating that they are ignoring largely the matter of price while looking out for needed supplies. It is this broader buying interest that gives the market a livelier tone and which instills confidence in the paper manufacturer and dealer that the time is not far off when trade activity will expand. A majority believe that by the end of August much more favorable market conditions will exist. Emphasis is placed on the revival that has taken place in other industries, and it is felt that the paper trade is about due to begin to share in the increased commercial activity.

Market developments within the past few weeks have been rather slim in number and of little importance. Probably the most important are the efforts being made by paper mills to further reduce wages of their operatives. Paper manufacturers in the Kalamazoo district have put into effect a sharp reduction ranging from 13 to 30 per cent, and those in the Holyoke district have proposed a similar cut. This latter matter is to be discussed at a conference between mill representatives and union leaders called for the first week in August. The labor difficulties in news print mills have been pretty well smoothed over. Most of the striking operatives have returned to work pending a decision on the wage dispute by an arbitration committee, which decision is expected to settle the matter definitely.

Prices on paper are mostly moving downward but the extent of the declines is narrow. This is logical in view of the fact that, as stated above, prices already are fairly well stabilized on reasonable levels. Manufacturers are wisely not trying to stimulate demand by slashing prices, having found that such procedure avails them nothing in the way of increased business, though the average paper mill is accepting orders at concessions in price when their refusal to do so would mean a loss of business. Competition for orders is unusually keen, obviously this would be so under present circumstances, but manufacturers are proceeding cautiously in quoting lower prices and are refusing to book business at a loss to themselves simply to outdo the other fellow.

With news print production on the rise, and consumption at a rather low point—as is customary for midsummer—the market for print paper is developing an easier tone. Rumors which seem to have their origin in authoritative sources to the effect that the contract basis on news print will be reduced $10 per ton to 4.25 cents per pound at mills for roll news for delivery over the final quarter of the year contribute to the market easiness. Roll news print is reported selling to transient buyers at 4.50 cents a pound f.o.b. mills, and in some out of the way cases at a trifle less, though the contract basis for the third quarter is well maintained at 4.75 cents. Naturally with these price conditions obtaining publishers are placing few new contracts and are picking up spot lots to fill in their requirements. However, with most newspapers printing small issues today, there is but a slight need for additional paper tonnage.

Book papers are fairly steady though slight declines have been reported in some grades. Machine finished book is quotable down to 6 cents per pound at mills, and super book at 7 cents. Tissues are moving in relatively good volume and at generally unchanged quotations. Wrapping papers are in moderate demand, everything considered, and are quoted at a basis of about 6 cents a pound on No. 1 domestic kraft. Fine papers are in little call, this being mainly due to the situation in the printing trade and to the unwillingness of jobbers to buy other than to cover actual commitments.

The box board situation is a little improved over recent weeks. Consumers are commencing to take deliveries of board ordered a month or so ago, and members of the trade report a quickening of the movement of board and a stiffening of prices.

Endorse Forestry Program

The endorsement of the Snell-McCormick Forestry bill by the Illinois State Federation of Women's Clubs, and the editorial declaration of the great magazine, Good Housekeeping, in favor of a forestry campaign, are two of the biggest recent developments in the forestry program, which is being pushed by the National Forestry Program Commitee, of which the American Newspaper Publishers Association is a part.

The Good Housekeeping declaration is based on the Chinese famine, and the prophecy that unless we protect American forests America will eventually face the situation now confronting the Chinese, and this message of forestry is thus carried by this magazine into a million homes, and to five times that many readers.

The Illinois women's endorsement follows closely upon the endorsement of the Snell-McCormick bill by the New York City Federation, after Dr. Hugh P. Baker, a member of the National Forestry Program Committee, representing the American Paper and Pulp Association, had told the metropolitan federation the need of a national forestry program.

Another recent endorsement is that of the Associated Mountaineering Clubs of North America, comprising forty-five mountain climbing and out of door organizations.

W. H. FURBISH, Vice-Pres. J. L. MUNRO, Treas.

PAPER TRADING CO.
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Paper Mill Supplies
Dryer Felts, Paper Stock

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Now Is the Time to Buy Our Raw Materials

Out of the forty different kinds of paper stock graded in our many large warehouses, you are assured a steady, reliable source for procuring raw materials in practically every branch of paper making.

Having specialized for 35 years in this one field you can depend upon a clean, well-packed, uniform product throughout; fulfillment of delivery promises; and because of our output of 300 tons daily, big tonnage at all times.

Write us your wants and we'll gladly send further information.

Mendelson Bros. Paper Stock Co.
910 South Michigan Avenue, Chicago, Ill.
Long Distance Phones: Harrison 2840 and 5557.

PENN PAPER & STOCK CO.

Assorted Waste Paper in Large Quantities

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J. ANDERSEN & CO.
FREDERICK BERTUCH, SPECIAL PARTNER
21 East 40th Street, New York City

Importers of Chemical Pulps
BLEACHED AND UNBLEACHED

Agents for Kellner Partington Paper Pulp Co., Ltd.
Sarpsborg, Norway; Forshaga, and Edsvalla, Sweden;
Bergvik and Ala Nya Aktiebolag, Söderham, Sweden

Papermaking Rags

The papermaking rag market is in a condition quite characteristic for the midsummer season. There is little demand of consequence from consuming sources; if anything, paper manufacturers are buying in substantially less amounts than they ordinarily do at this time of the year, and the price tone is distinctly weak. These are some factors on the bullish side of the market but these seem to have little influence at present because actual trade is of such slight proportions that these factors are given scant opportunity to make themselves felt. Judging from reports received from representative dealers, accumulations of rags in graders' establishments are considerably under normal notwithstanding the slow movement of supplies into mill channels in recent months. This seems logical when it is considered that the low prices obtainable for old rags during the past half year or longer must have drastically curtailed collections throughout the country, and that the dullness existing in the clothing manufacturing industries must have greatly reduced the amount of piece goods cut up and thus limited the quantity of cotton cuttings produced. Of course, the reduced consumption of rags serves to offset these conditions in the producing field, and there appears to be no danger of a shortage of rag stock developing, but it is the contention of a good many dealers that were demand a little more voluminous at least certain grades or rags would appreciate in value because of the low visible supply.

The whole situation as it now shapes up is that demand is hardly sufficient to sustain the market. Individually and collectively, paper mills are buying in such small amounts that no single grade of rag stock exhibits any steadiness in price, rather the tendency is toward even lower levels despite the insistence of dealers that prices in most instances are at a point where there is no profit afforded them in collecting, sorting and baling goods for the consumer. Buying is very spotty. A mill will come into the market and purchase a few lots of rags and then disappear, not to be heard from again as a buyer for a lengthy period. Even roofing felt manufacturers, who usually buy in more or less consistent fashion, are absorbing but light tonnages of rags at spasmodic intervals. Fine paper mills, with few exceptions, claim to have good-sized stocks of rags in store and are seldom noted in the market excepting for minor parcels of material.

Prices on a majority of grades are nominal. Dealers ask one figure, and, on counter offers, accept sharp reductions. Roofing rags in the East have sold as low as 60 cents a hundred pounds on No. 2 packing. New white shirt cuttings of No. 1 quality are offered at 9 cents and find few takers; blue overall cuttings are available at 5.50 cents, fancy shirt cuttings at 5.25 cents, washables at 4 cents, No. 1 old repacked whites at 4.75 cents and repacked thirds and blues at 1.60 cents.

Average quotations f. o. b. shipping points follow:

New Stock—	New York and Chicago
White shirt cuttings, No. 1	8.75-9.25
White shirt cuttings, No. 2	6.00-6.25
Fancy shirt cuttings	5.25-5.50
Washables, No. 1	4.00-4.25
Unbleached muslins	7.50-7.75
White lawns	7.50-7.75
Overall cuttings, blue	5.50-5.75
Black silesias	3.00-3.25
Old stock—	
Whites, No. 1 repacked	4.75-5.25
Whites, No. 2 repacked	2.60-2.80
Whites, house soiled	1.40-1.60
Whites, street soiled	1.10-1.25
Thirds and blues, repacked	1.60-1.75
Thirds and blues, rough	.90-1.00
Black stockings	1.50-1.65
Lace curtains	4.25-4.50
Cotton canvas, No. 1	3.00-3.25
White cotton batting	1.25-1.50
Roofing, No. 1	.70- .85
Roofing, No. 2	.60- .75

Rope and Bagging

Old manila rope is one of the few descriptions of papermaking material that displays steadiness in price. This seems due more to unsold stocks being at a comparatively low level than to any broad demand from mills though consumers on the whole are absorbing supplies in fairly steady fashion. No. 1 rope is freely bringing 4 cents a pound at shipping points, which price is relatively higher than prevails on probably any other kind of raw material for the papermaker. Old strings have slumped in price and are available to consumers at around 75 cents a hundred pounds.

The old bagging market is dormant. Consuming demand is of negligible volume, and the few buyers seeking supplies are getting the small lots of bagging wanted at practically their own bidding prices. No. 1 scrap is said to have sold down to 60 cents a hundred at shipping points though dealers' quotations range higher than this. No. 1 gunny is available at one cent a pound and less.

Quotations f.o.b. shipping points are:

	New York and Chicago
Gunny, No. 1 domestic	1.10-1.15
Gunny, No. 1 foreign	.90-1.00
Scrap bagging No. 1	.75- .85
Roofing bagging	.45- .55
Wool tares, heavy	1.50-1.75
Wool tares, light	1.25-1.50
Manila rope, No. 1 foreign	3.75-4.00
Manila rope, No. 1 domestic	4.00-4.25
Sisal strings	1.50-1.75
Mixed strings	.75- .85

Old Papers

Fundamentally the old paper market shows little change. Consuming mills are buying in small quantities, and the trend of prices continues downward. There is apparently no question that less waste paper is being collected today than in a long time; for that matter less is being produced as print shops are running at materially reduced schedule and as a majority of the country's publications, daily and periodical, are printing smaller issues than usual, yet the lighter supply is easily offset by the reduced demand from consuming plants. The bulk of old paper consumed is used by board mills, and when it is considered that board manufacturers are operating their plants at only around 50 per cent of capacity, if this much, the explanation for the small demand for old paper is readily had.

Prices on nearly all grades have eased off a little further.

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CASEIN
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Bleached and Unbleached
WOOD PULP
of Every Description
M. GOTTESMAN & COMPANY
INCORPORATED
18 East 41st Street NEW YORK, N. Y.
Established 1886

Soft white shavings probably represent the firmest item in the market and yet No. 1 soft shavings have sold down to 2.15 cents a pound at shipping points, with consumers reporting no difficulty in securing all the supply wanted at between this figure and 2.35 cents. Hard white shavings of No. 1 quality are bringing no better than 2.85 cents a pound in the East, with sales down to 2.65 cents reported, and there has been quite a fall in prices on old kraft paper to 1.50 cents and less for No. 1 packing. Book stock is available at 80 to 90 cents a hundred, ledgers and writings at 1.50 to 1.75 cents and white news cuttings at 1.40 to 1.60 cents. No. 1 mixed paper is reported selling in New York at 25 cents a hundred pounds and less, and folded news at under 35 cents, though in the West slightly higher prices prevail.

F.o.b. shipping points quotations are:

	New York and Chicago
Hard white shavings No. 1	2.65 -2.85
Hard white shavings Nos. 2-3	1.75 -2.25
Soft white shavings	2.15 -2.35
Colored shavings	1.00 -1.15
Heavy book, No. 1	.80 - .90
Crumpled No. 1	.65 - .75
Ledger stock	1.50 -1.75
Kraft No. 1	1.40 -1.60
Manilas, No. 1	.70 - .80
White blank news	1.40 -1.60
Overissue news, No. 1	.55 - .60
Folded news	.32½- .42½
Mill wrappers	.55 - .65
Box board cuttings	.27½- .32½
Mixed paper, No. 1	.22½- .27½
Common paper	.17½- .20

Chemical Pulp

Pronounced easiness characterizes quotations on chemical wood pulp and the market displays a lack of important trade activity. Paper manufacturers are doing very little buying of consequence, presumably partly because they are not in immediate need of additional supplies and partly because the weak tone of prices causes them to expect that pulp will be available later on at further reductions in price. Sharp recession in quotations has occurred within the past several weeks, and the end of the decline does not yet appear in sight. Domestic producers are doing what they can to sustain the market and are endeavoring not to press buyers, having found that efforts to stimulate buying under ruling circumstances meet with scant success, but with foreign competitors offering pulp at drastic cuts in price, manufacturers in the United States and Canada are being obliged to lower prices also.

It is problematical just how low pulp can be bought. Domestic bleached sulphite is offered in some quarters down to 3.50 cents per pound at the pulp mill, though producers of strictly No. 1 bleached sulphite are asking substantially higher than this figure, around 4.50 cents or more being a representative market quotation on guaranteed No. 1 bleached. News grade sulphite has slumped off to around 2.50 cents, and easy bleach to 3 cents, while a good grade of unbleached sulphite is available at 2.75 cents and probably for less. Kraft is down to 2.50 cents and is meeting with a slow scale even at this level.

Quotations f.o.b. pulp mills follow:

Bleached sulphite	4.00-4.50
Easy bleaching sulphite	3.00-3.25
Unbleached sulphite No. 1	2.75-3.00
News grade sulphite	2.50-2.75
Soda pulp, bleached	4.25-4.50
Mitscherlich unbleached	3.50-3.75
Kraft No. 1	2.50-2.75
Screenings, refined	.90-1.00

BATHURST LUMBER COMPANY, LIMITED

PRICE & PIERCE, LTD.
17 East 42nd Street, NEW YORK CITY

ARE NOW THE

SOLE SELLING AGENTS
for Bathurst Pulp

Unbleached Sulphite 50 tons daily
Kraft Pulp 50 tons daily

Our pulp is made from Canadian Spruce
We ship in sheets, baled

BATHURST, NEW BRUNSWICK, CANADA

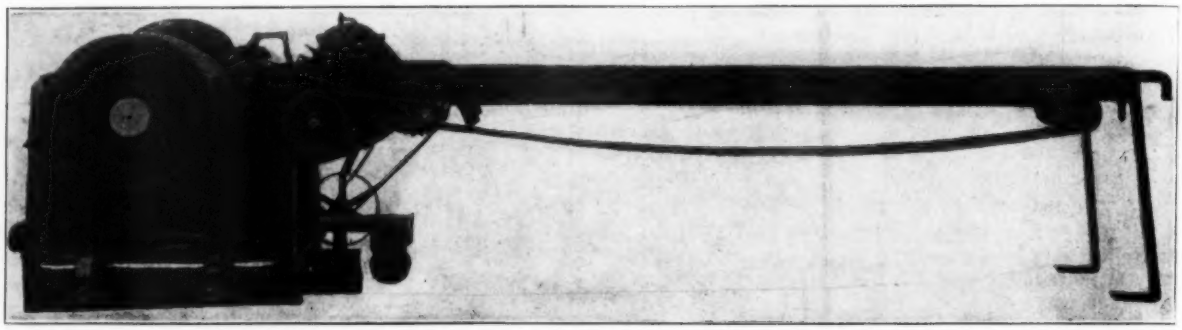
ALVAH MILLER, President *TOM T. WALLER, Vice-Pres.*
NATH'L L. MILLER, Sec'y-Treas.

CRAIG-BECKER COMPANY
INC.

Domestic and Foreign Ground Wood and Sulphite

52 VANDERBILT AVENUE
NEW YORK CITY

No. 11 "GIANT" PAPER STOCK CUTTER



Capacity 2½ Tons Per Hour

Especially Adapted for Handling Waste Paper, Magazines, Etc., Before Feeding to the Beaters

W hatever You Cut, A GIANT Will Solve Your Problem

LET US FIGURE IT OUT FOR YOU

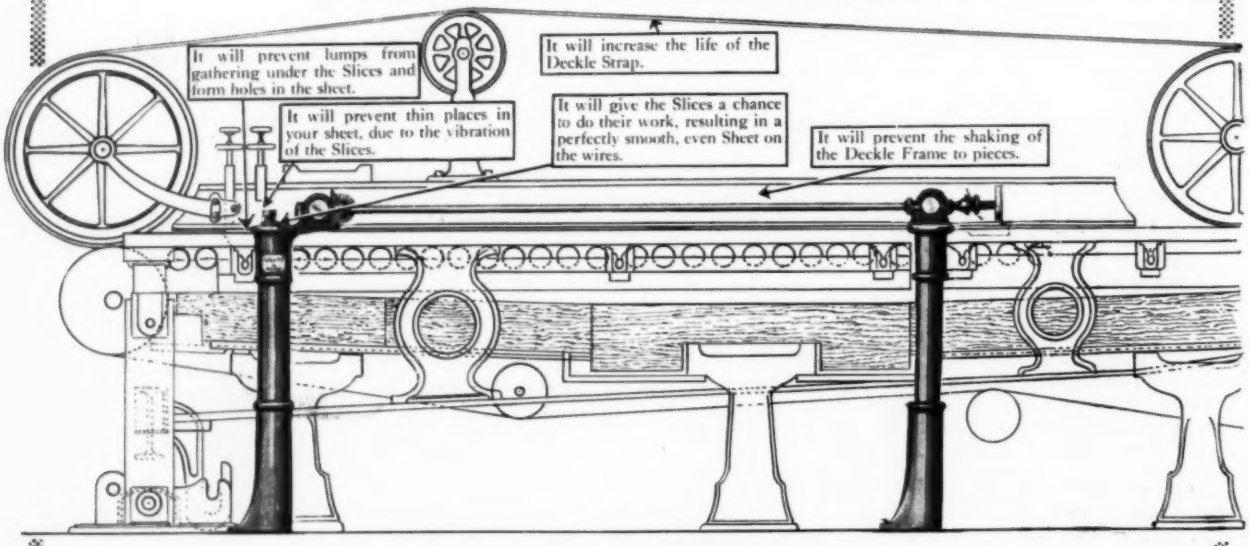
TAYLOR, STILES & COMPANY, Riegelsville, N. J., U.S.A.

WATEROUS ENGINE WORKS
Brantford, Ont., Canada
Canadian Representatives

R. J. MARX
133 Finsbury Pavement, London E. C.
Sole Agents for Europe

The Acme Deckle Frame Support

"is indispensable to the making of Good paper"


It will prevent lumps from gathering under the Slices and form holes in the sheet.
It will prevent thin places in your sheet, due to the vibration of the Slices.
It will increase the life of the Deckle Strap.
It will give the Slices a chance to do their work, resulting in a perfectly smooth, even Sheet on the wires.
It will prevent the shaking of the Deckle Frame to pieces.

It will make better edge, save breaks and take less power.

Manufactured and Distributed by

HUBAND & NASH

Menasha, Wis.

Most of the best mills in this country are equipped with this device.

Mechanical Pulp

There is probably a firmer tone evinced by ground wood than any other kind of papermaking raw material. This is due not so much to any concerted buying movement, although the average consumer is today absorbing a little larger supply than he immediately requires, but to the bullish conditions faced by the market and to the common belief among those on the selling end of the trade that higher prices are in prospect. This summer has been the hottest and dryest experienced in some years, it being estimated by Government authorities, for example, that the rainfall throughout the country has been five inches less than the average spring and summer in recent years, and this leads pulp grinders and dealers to anticipate a severe drought in pulp grinding districts during the next few weeks, thus interfering with grinding operations and reducing the production of ground wood. For this reason manufacturers and jobbers are firm in their views and are not pressing mechanical pulp onto the market; instead they are mostly waiting for buyers to come to them for supplies and are generally refusing to enter commitments covering deliveries more than a month ahead.

Although prices have not advanced, there is a decidedly upward tendency noted. Domestic grinders are quoting between $28 and $30 a ton at producing mills for prime spruce ground wood, and this is the prevailing market price range excepting in cases where grinders are situated a good distance off from the consuming mill when the difference in freight brings the cost of pulp to the consumer up to the same level of around $35 to $36 a ton delivered. In the aggregate, there is a fair volume of business reported; certainly demand for ground wood is relatively far livelier than for chemical wood pulp.

Chemicals

Most of the current activity in the papermakers' chemical markets involves shipments by producers to contract customers. There is but a small spot demand, reflecting the dullness prevailing in the paper industry and the ability of consumers to get along at present largely with contract deliveries of chemicals. Prices are in many cases nominal, with no important changes reported in quotations. Bleaching powder holds at around 2.25 cents per pound f.o.b. works in domestic drums for spot shipment with some manufacturers accepting offers at slightly less. Soda ash is quoted at about 2 cents a pound, caustic soda at 2.50 cents, casein at between 8 and 9.50 cents and brimstone at $15 to $16 per ton at the mines. Quotations follow:

Alum, lump ammonia	3.75 4.00
Alum, lump starch	4.15- 4.40
Blanc fixe, powdered	3.75- 4.00
Bleaching powder (domestic drums)	2.15- 2.25
Brimstone (ton)	15.00-16.00
Casein	8.00- 9.50
Caustic soda, spot delivery	2.40- 2.60
China clay, domestic washed	8.00-10.00
China clay, foreign	12.00-16.00
Rosin, grade E	5.15-
Satin white	2.00- 2.25
Soda ash, 58 per cent light (bags)	1.75- 2.00
Sulphite of alumina, commercial grade	1.75- 2.00
Starch, papermakers', in bags	2.35- 2.50
Talc (ton)	16.00-18.00

The M. J. Dougherty Co., piping fabricators and engineers, Philadelphia, announce that they have secured the Tomlinson Steam Specialty Co., of Cleveland, Detroit and Akron, to represent them in the upper half of the State of Ohio and all of Michigan. Mr. A. E. Tomlinson, who heads his firm, is a very capable and experienced engineer and has a large force of sales engineers in this district.

Sulphate Alumina

All Grades for Paper Mills

Detroit Chemical Works

DETROIT MICHIGAN

Write us about

CADILLAC BRAND

A PERFECT SUBSTITUTE FOR IRON FREE

Let the Red-Arrow

Be Your Guide to Better Dyestuffs

The **Red-Arrow** is rapidly becoming recognized as the symbol of dyestuff excellence. When you purchase dyestuffs branded with the **Red-Arrow** you can always feel confident you are getting a dye with the highest tinting power and absolutely consistent in quality.

If you have a special dye problem or wish any particular formula, our service Department of Color Chemists will be glad to assist you without incurring any obligation on your part.

DICKS, DAVID COMPANY
INCORPORATED
Main Office, 19-21 North Moore Street, New York, N. Y.
Boston, Mass. Chicago Heights, Ill. Paterson, N. J.
Charlotte, N. C. Glens Falls, N. Y. San Francisco, Cal.

Red-Arrow Dyestuffs

Bardeen Paper Co.

Otsego, Mich.

Printing Papers of Merit

For LETTERPRESS, OFFSET *and* LITHOGRAPHIC PRINTING

Offset Blanks Offset Bristols

Porcelain, Peninsular and Purity Enamel Book

M.F. and S&SC Book and Catalog

English Finish Opaque

Coated Blanks
Post Card Translucent

We
are
Manufacturers
and
Exporters
of

PAPER

also
Importers
and
Jobbers

MAURICE O'MEARA CO.
448-50 Pearl Street NEW YORK CITY

"WORK!
Thank God for the might of it,
The ardor, the urge, the delight of it,
_____"

Angela Morgan, author of the above, had the correct idea.

Our Mill keeps going strong and the excellent conditions with us are appreciated by a full quota of contented, skilled and conscientious workers.

KVP Brands: Pure Waxed Papers, Genuine Vegetable Parchment, Bond Paper, White and 6 colors, and Blood-Proof Meat Paper are full value.

Ask for Samples.

"World's Model Paper Mill" KVP Kalamazoo Vegetable Parchment Co. Kalamazoo, Michigan, U. S. A.

Books on Paper Manufacture

Subscriptions are being taken for the new Textbooks on the Manufacture of Pulp and Paper of the Joint Committee on Vocational Education of the Pulp and Paper Industry, a complete set of which should be owned by every firm or individual connected with the industry.

The set will be complete in five volumes. Volumes I and II, deal with arithmetical operations, elementary mathematics, drawings, etc. Volumes III, IV and V, to be issued shortly, will deal with pulpwoods and their preparation; manufacture of pulp; analytical methods; and paper manufacture in all its aspects.

Volumes I and II are now on sale at $5.00 a volume. In the selection of classroom problems bearing on the principles and practice of pulp and paper manufacture they represent the highest standard in textbook publishing.

Orders, with remittances, will be filled by Thomas J. Keenan, secretary of T.A.P.P.I., 542 Fifth Avenue, New York.

New Papers

Writing—	
White rag	13-40
White sulphite, No. 1	9-20
Colored	11-20
Ledger—	
White rag	14-50
White sulphite	11-25
Colored sulphite	13-25
Colored rag	16-50
Bonds—	
White rag	10-40
White sulphite	8-20
Colored sulphite	10-22
Colored rag	12-40
Book—	
No. 1 S. & S. C.	7.00- 8.00
Machine finished	6.00- 6.50
English finished	6.75- 7.25
Coated and enameled	9.00-10.00
Lithograph, M. F.	10.00-11.00
News Print—	
Rolls, contract	4.75- 5.00
Rolls, transient	4.50- 4.75
Sheets	5.00- 5.25
Side runs	3.50- 3.75
Cover Stock—	
Coated, both sides	9.25-
Coated, one side	9.20-
Wrappings—	
No. 1 kraft	6.00- 6.50
No. 2 kraft	5.50- 6.00
Boards—	
	New York and Chicago
Solid news	37.50-42.50
Straw	40.00-45.00
Plain chip	28.00-32.00
White coated chip	55.00-60.00
Manila coated chip	50.00-55.00
Binders board	75.00-85.00

Graphic Arts Exposition a Great Success

The Graphic Arts Exposition and Convention of the International Association of Printing House Craftsmen, held at the Coliseum in Chicago, July 23 to 30, 1921, was the greatest showing of the tools and processes of the printing craft which was ever gathered together. The attendance for the week is said to have numbered about 65,000 and business done amounted to over $1,000,000. Representatives from twenty-six states, as well as from Mexico and South America attended the Exposition, and the best part of it all, they came to buy. The delegation from the Mexican Republic, headed by Rudolpho Garduno, government printer of Mexico, came to get new ideas on equipment and to buy machinery.

Exhibits of Early Handicraft

Exhibits of the handicraft of Mexico were in the Butler Paper Company booth. The first printing done in the New World, according to James Carson, assistant general manager of the National Paper and Type Company, who was host to the Mexican delegation, shows scenes in Mexico City. That was done 400 years ago—or 102 years before the first printing was done in the American colonies.

The name of the first paper in the New World, printed in Mexico City, was Mercurie Bolante (Flying Mercury). That was issued twelve years before the first paper was printed in the Colonies. The name of the first book, a copy of which was on exhibit, was "Le Escala Espiritual Para Llegar al Cielo."

One of the very unique and interesting features of the exposition and one which probably attracted the largest crowds was the miniature paper-making machine exhibited by the American Writing Paper Company. This machine was described in our July number. It was busy all week producing paper.

Crocker-McElwain Company, of Holyoke, Mass., had an interesting exhibit showing a printing press on which they demonstrated the printing of halftones on their Certificate Bond by means of a new process called the Certificate Process. It is a simple, quick and absolutely successful make-ready for halftone printing on Certificate Bond. It calls for the use of Certificate Flex-o-Lay, a specially compounded resilient blanket of designated flexibility and thickness. The complete process is made perfectly clear in an instruction book which the company gives away free. It is something new and now makes possible the use of bond paper in printing letterheads with halftones, and dealers catalog sheets where hard usage requires strong paper.

The Menasha Machinery Manufacturing Company, of Menasha, Wis., exhibited the Claybourn Process of Plate Treatment which claims an absolutely non-stretch curved printing plate. This exhibit was particularly interesting to carton manufacturers and multi-color rotary printers. The process is in everyday use at the Menasha Printing and Carton Company at Menasha, Wis., and has given them phenomenal success on intricate color and process printing. By it the printing plate is mechanically curved and made perfect to go to press without make-ready.

Other large exhibits of particular interest to the printing industry were there, too numerous to mention. Great credit is due to the Chicago organization of Printing House Craftsmen for knowing how to run a show and for the efficient manner in which everything was staged. The predominant note of the show was "Progress." It showed that we are on our way to great accomplishments in the field of printing, and as this industry is allied so closely to the manufacture of paper the same can also be said of our own industry.

If there was a lesson learned from attending this exposition, it was the determination on the part of each to do his share in accelerating the return of stabilized conditions by faithfully performing whatever task is set before us.

Alonzo N. Burbank

Alonzo N. Burbank, who died recently at his home in Portland, Me., was one of the founders of the International Paper Company and formerly its president. He was born in Franklin, N. H., in 1843 and did various odd jobs around town until he became a clerk in a paper mill. During the nineties, when competition had forced the price of paper down to one and a quarter cents a pound, he and others formed the International Paper Company, that bought fifteen mills.

Low water has caused the closing down of a number of paper mills in Wisconsin, and particularly pulp wood grinders.

Holyoke Machine Co.

HOLYOKE MASS.

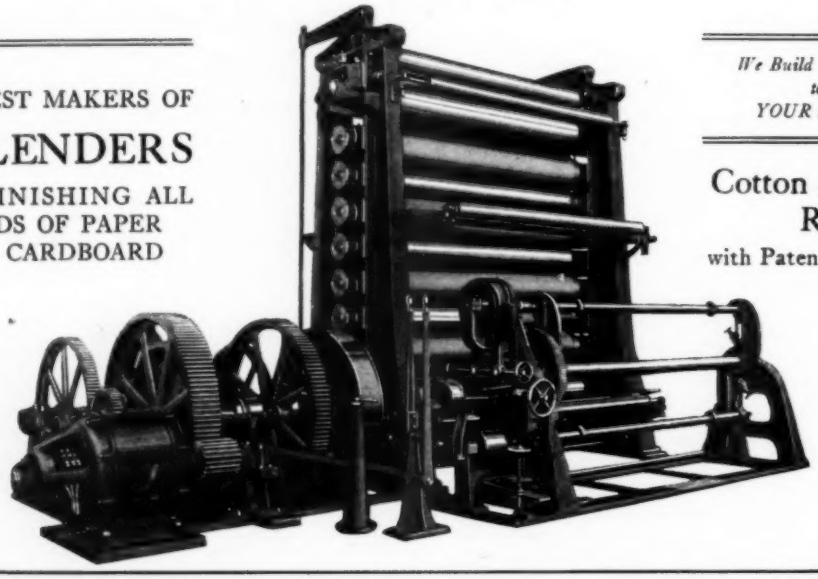
MAKERS OF

Improved Machinery for Wood Pulp, Paper Mills, Paper Converters, Printers and Lithographers

LARGEST MAKERS OF

CALENDERS

FOR FINISHING ALL KINDS OF PAPER *and* CARDBOARD



We Build Our Machinery to Meet YOUR Requirements

Cotton and Paper Rolls

with Patented Fastenings

The Sandy Hill Iron & Brass Works

Hudson Falls
New York

Manufacturers of Paper and Pulp Mill Machinery

Wood Pulp

The present situation in foreign wood pulp is characterized by pronounced weakness. This is due chiefly to the lack of important buying by American consumers, and also largely to the anxiety of Scandinavian producers to dispose of some of their accumulations of pulp and the resultant selling pressure coming from this source. Prices have undergone sharp recession recently, and the end of the decline does not appear yet to have been reached. It is understood on good authority that pulp manufacturers in Sweden have abrogated their price agreement temporarily and there is almost a scramble to market pulp in the United States. With the paper manufacturing industry in this country experiencing dullness, and with consumers of pulp showing little desire to buy other than small lots directly required, prices on pulp are suffering, and the situation at present is such that it is questionable at just how low purchases of pulp could be effected in some directions.

One of the principal reasons for the prevailing situation in Scandinavian pulps is that England—ordinarily a leading buyer of Norwegian and Swedish sulphite—is today taking but small supplies, having ample stocks to last for some time at the present rate of consumption. Other European paper manufacturers are buying in very sparse amounts, thus prompting Scandinavian pulpmakers to look to America as a market, and urgent efforts are being made to find an outlet for stocks in this country. The abnormal value of the American dollar in Europe is also a salient factor in inducing the Scandinavians to endeavor to sell pulp to the United States. The result is that offerings are being made at prices which in frequent instances are below the prices prevailing on domestic pulps, the easiness in prices being helped along by activity among the Germans to also market pulp in the United States. No longer governed by a price agreement, Swedish producers are reported repeatedly cutting prices, and apprehension is felt in some quarters of the trade on this side that unless conditions change for the better that a repetition of the situation that has existed at intervals in years past when the Scandinavians flooded the American market with pulp may occur.

Bleached sulphite of No. 1 quality is available at 4.25 cents a pound ex the dock at American Atlantic ports, and there have been reports of offerings even down to 4 cents. Foreign kraft pulp has slumped off in price to where fair-sized lots are offered at 2.50 cents and less, while easy bleaching sulphite is quoted at 3.25 cents and No. 1 unbleached sulphite at 3 cents. Arrivals during July were heavier than in preceding months, and it is stated that a good part of shipments were on consignment.

Receipts at the port of New York in July and nominal current spot market quotations follow:

Bleached sulphite	$ 4.25- 4.75
Unbleached sulphite, No. 1	3.00- 3.25
Easy bleaching	3.25- 3.50
Mitscherlich unbleached	3.75- 4.00
Kraft	2.50- 2.75
Ground wool, per ton	25.00-30.00

Nilsen, Rantoul & Co., 12 bls. from Christiania and 14 bls. from Gothenburg; J. Andersen & Co., 150 bls. from Christiania; A. J. Pagel & Co., 1,000 bls. from Hamburg; M. Gottesman & Co., 272 bls. from Hamburg; Mechanics & Metals National Bank, 30 bls. from Christiania; H. Hollesen, 3,603 bls. from Bremerhaven; Ira L. Beebe & Co., 7,392 bls. from Bremerhaven; Bulkley, Dunton & Co., 160 bls. from Vancouver; Irving National Bank, 5,000 bls. from Darvik and 5,000 bls. from Arendal; Woodpulp Trading Co., 330 bls. from Gothenburg; Kelly & Co., 336 bls. from Gothenburg; Scandinavian-American Trading Co., 762 bls. from Gothenburg; Order, 90 bls. from Liverpool and 1,000 bls. from Hamburg.

Paper Stock

Importations of paper stock into the United States continue at a low point. The great bulk of shipments from European sources to this market at present comprise but small tonnage, and the light movement of supplies forcibly reflects the quietness prevailing in the paper manufacturing industry of the United States and Canada and the slow buying of raw material by paper mills. Importers assert that there is little incentive afforded them to bring goods in under existing circumstances. Consumers are reluctant to buy excepting to cover immediate wants, and invariably when supplies are imported on speculation the prices obtainable for the stock are such as to leave scant room for profit to the import firm. Moreover, most European dealers demand prices for their goods that are far out of line with prevailing market levels on this side, which also serves to limit the volume of material brought into the American market.

Occasional shipments of old rope and rags are arriving, and now and then a lot of scrap bagging, jute waste or some other kind of papermaking stock is received, but aggregate imports are of little importance. Reports generally tell of comparatively large stocks being held in the various European countries.

Arrivals at New York in July follow:

Old Rope

First National Bank of Boston, 22 coils from Stockholm, 543 coils from Antwerp, 157 coils from Genoa, and 64 coils from Christiania; International Purchasing Co., 32 bls. from Havre and 250 coils from Gothenburg; Brown Bros. & Co., 54 coils from Bristol and 367 bls. from Hull; United Fruit Co., 6 bls. from Cristobal; Irving National Bank, 98 coils from Leith; Mechanics & Metals National Bank, 86 coils from Marseilles and 179 bls. from Algiers; Order, 97 bls. from Rotterdam.

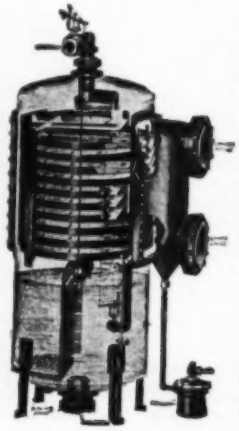
Old Bagging

E. J. Keller Co., 35 bls. from Havre; Edwin Butterworth & Co., 85 bls. from Antwerp; Mechanics & Metals National Bank, 1,113 bls. from Havre.

Rags

Guaranty Trust Co., 80 bls. from Antwerp; Brown Bros. & Co., 417 bls. from Antwerp; Albion Trading Co., 10 bls. from London and 10 bls. from Antwerp; E. J. Keller Co., 385 bls. from Havre and 346 bls. from Bremerhaven; Castle, Gottheil & Overton, 166 bls. from Havre; Mechanics & Metals National Bank, 48 bls. from Bremerhaven, 521 bls. from London and 56 bls. from Algiers; Iglas Abela & Co., 36 bls. from Valetta; Goldman, Sachs & Co., 132 bls. from Antwerp; Daniel M. Hicks, Inc., 126 bls. from Havre; Maurice O'Meara Co., 224 bls. from Antwerp; Royal Mfg. Co., 48 bls. from

The New Stickle Feed Water Heater and Purifier

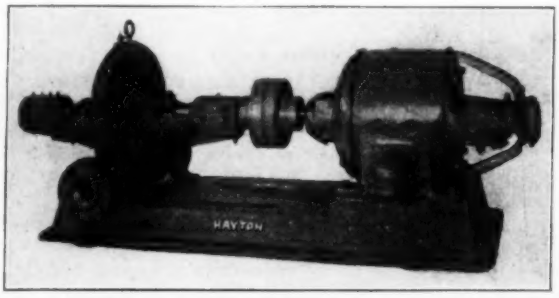


The reason we changed the construction of our heater from cast iron shell to a steel shell was to meet the demand of consulting engineers who specify an open heater to carry from 10 to 15 pounds back pressure. This is particularly necessary in Paper Mills for drying the sheet with exhaust steam. When you put this pressure on a cast iron heater built up of rectangular flat plates you have gone far beyond the limit of safety. That is the reason we use a heavy steel shell. The same principles of heating and purification are carried out as in our old heater.

Open Coil Heater & Purifier Company
Indianapolis, Indiana
Boston Philadelphia

Hayton Centrifugal Pumps

SAVE POWER and MONEY
BY USING



HAYTON CENTRIFUGAL PUMPS
"With us it is an engineering problem"

Designed especially to meet the requirements of pulp and paper mills. We do not build a pump after OUR ideas and then try to sell it to you. We make a study of YOUR peculiar problems, and then build a pump to suit your needs. Hayton Pumps are built for hard, continuous operation, and will stand up under the most severe usage. We guarantee the highest efficiency, and maximum economy in power consumption.

We also build a full line of Sandusky Triplex pumps.

Let us have your specifications for quotations

Hayton Pump & Blower Co.
Manufacturers
APPLETON, WISCONSIN

Trimbey & Allen

GLENS FALLS NEW YORK

Manufacturers of new, automatic, POWER and LABOR saving machinery, as:

The Allen & Trimbey Automatic Continuous Mixing Machine

The Allen Cooking Control for Chemical Pulp

The Trimbey Automatic Consistency Regulator

The Wells Improved Rotary Sulphur Burner

The Trimbey & Tibbitts Soft Stock Meter
for metering Soft Stock Furnish to Beaters

"Vulcan Brand Means Superior Quality"

Vulcan
TRADE MARK

DRYER FELTS

Standard or Multiple Warp

WON'T NARROW, WON'T SHRINK

WISCONSIN FOURDRINIER AND CYLINDER WIRES
COTTON AND RUBBER BELTING
COTTON CUTTER TAPES
FELT WASHING SOAP
APRON CLOTHS

Morey Paper Mill Supply Co.
60 India Street
Boston Massachusetts

Antwerp; Order, 199 bls. from Bremen and 49 bls. from London.

Miscellaneous Paper Stock

Ladenburg, Thalman & Co., 67 bls. from Hamburg and 31 bls. from Dundee; Irving National Bank, 93 bls. from Leith; E. J. Keller Co., 18 bls. from Havre; Mechanics & Metals National Bank, 160 bls. from London and 45 bls. from Glasgow; Order, 115 bls. from Dundee.

Paper

Germany and the Scandinavians continue to send moderately large amounts of news print to the American market. The total tonnage being shipped here is of slight importance in comparison with the volume of print paper consumed in this country, but shipments in July showed that the Europeans are finding a market on this side of the Atlantic for at least some of their paper output. Approximately 12,000 rolls of news print was received through the port of New York last month, and it is understood that proportionately as large consignments arrived at other East coast ports, at Philadelphia especially where it is said lower freight is to be obtained than to New York.

Shipments of paper board from Germany to the United States also continue in fair amounts, and current importations include usual quantities of cigarette papers from France, and occasional lots of wrapping and hanging papers from France, England and other European sources. Arrivals of the various descriptions of paper at the port of New York in July follow:

Cigarette

R. J. Reynolds Tobacco Co., 1,000 cs. from Bordeaux; P. J. Schweitzer, 58 cs. from Bordeaux; American Tobacco Co., 700 cs. from Bordeaux; Rose & Frank Co., 44 cs. from Bordeaux and 52 cs. from Havre; Surbrug Co., 28 cs. from Havre; Wilkinson Bros. & Co., 6 cs. from Havre; B. E. Teale, 50 cs. from Genoa; Camancho, Roldan & Van Sickel, 191 cs. from Havre; Gluckmann & French, 5 cs. from Havre; Van Oppen & Co., 43 cs. from Havre; A. B. Newman & Co., 3 cs. from Rotterdam.

Printing

Sun-Herald Corp., 844 rolls from Gothenburg; Chemical National Bank, 1,215 rolls from Hamburg; Globe Shipping Co., 468 rolls from Hamburg; Heidelbach, Ickelheimer & Co., 125 rolls from Antwerp and 22 rolls from Rotterdam; B. F. Drakenfeld & Co., 74 cs. from Liverpool; National Bank of Commerce, 1,491 rolls from Rotterdam; R. F. Lang, 1,163 rolls from Hamburg; Irving National Bank, 323 rolls from Copenhagen; Henry Lindenmeyr & Sons, 110 cs. from Havana; New York American, 3,436 rolls from Gothenburg; Oxford University Press, 10 cs. from Liverpool; C. A. Johnson & Co., 40 bls. from Liverpool; Poland Paper Co., 1,520 rolls from Gothenburg; Prager Co., 1,262 rolls from Hamburg.

Wrapping

American Express Co., 552 rolls from Bordeaux; Foreign Trade Banking Corp., 450 bls. from Hamburg; American Paper Mills, 24 bls. from Rio de Janeiro; Equitable Trust Co., 127 bls. from Copenhagen; Schapirograph Co., 12 bls. from Hamburg; Cosmopolitan Shipping Co., 719 rolls and 203 pkgs. from Rotterdam.

Hanging

W. H. S. Lloyd & Co., 14 cs. from London; State Forwarding & Shipping Co., 240 bls. from Antwerp; A. Murphy & Co., 7 bls. from Liverpool; Van Oppen & Co., 2 cs. from Liverpool; R. F. Downing & Co., 3 cs. from London; Order, 2 bls. from Hamburg.

Writing

Goodman & Levy, 5 cs. from Havre; E. Stegemann, 3 cs. from Havre; New York Blue Print Paper Co., 32 cs. from Marseilles; J. W. Hampton, Jr., & Co., 12 cs. from Hamburg;

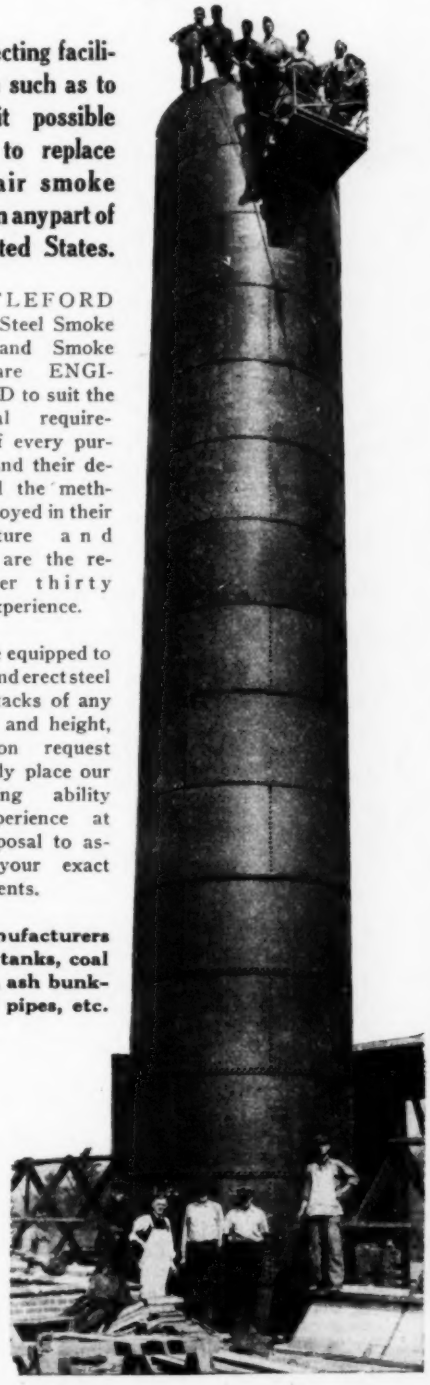
SMOKE STACKS
BREECHINGS
TANKS

Our erecting facilities are such as to make it possible for us to replace or repair smoke stacks in any part of the United States.

LITTLEFORD BROS. Steel Smoke Stacks and Smoke Flues are ENGINEERED to suit the individual requirements of every purchaser, and their design and the methods employed in their manufacture and erection are the results over thirty years' experience.

We are equipped to furnish and erect steel smoke stacks of any diameter and height, and upon request will gladly place our engineering ability and experience at your disposal to ascertain your exact requirements.

Also manufacturers of steel tanks, coal bunkers, ash bunkers, coal pipes, etc.



LITTLEFORD BROTHERS
500 East Pearl Street Cincinnati, Ohio

LOCKPORT Felts

EXCLUSIVE MAKERS OF

Paper Makers' Felts

Have You Run Them?
If Not, Why Not?

Are You Interested in Accurate Running Felts?

Give Us a Trial
Get Authentic Information
Ask the Men Who Run Them

Yours for service

LOCKPORT FELT CO., Newfane, N. Y.

New Sand Filter

A SPECIAL filter for paper mills, producing all the results the paper manufacturer desires. It is a modification of the well known Hungerford filter adapted to paper mill use. It is constructed of concrete, strictly wrought iron pipe, brass strainers and especially prepared silica sand. It is as durable and efficient as can be built at any cost. It can be sold at a very low figure.

This filter gives perfectly clear water, washes thoroughly, does not require renewal of the sand bed, is absolutely reliable in the performance of its duty and requires a minimum amount of attention.

Send for full particulars

Hungerford & Terry, Inc.
PHILADELPHIA, PA.

EASTWOOD Wire Mfg. Co.

Fourdrinier Wires
Cylinder and Washer Wires

Belleville, New Jersey
U. S. A.

WE ALSO MANUFACTURE

Valves, Unions, Cocks, Fittings, Digester Parts, Castings, etc., for Sulphite Mills from Our Perfection Bronze

Largest producers in the world of highest grade Brimstone —guaranteed 99½% pure—free of Arsenic and Selenium.

The UNION SULPHUR COMPANY

In so far as possible we will be glad to offer advice or suggestions to prospective buyers who are using or may be contemplating the use of brimstone.

FRASCH BLDG., 33 RECTOR STREET
NEW YORK

G. W. Sheldon & Co., 4 cs. from Havre; Happel & McAvoy, 2 cs. from Havre; Order, 23 cs. from London.

Drawing

Keuffel & Esser Co., 41 cs. and 196 rolls from Hamburg and 27 cs. from Rotterdam; Lunham & Moore, 6 cs. from London; Bernard, Judae & Co., 4 cs. from Hamburg; McGowan Bros., 4 cs. from Liverpool.

Tissue

Parsons Trading Co., 3 cs. from London; Meadows, Wye & Co., 3 cs. from Liverpool.

Filter

Lunham & Moore, 24 cs. from London; Eimer & Amend, 13 cs. from Rotterdam.

Boards

C. B. Richard & Co., 3 cs. from Hamburg; Bendix Paper Co., 90 cs. from Hamburg; Metropolitan Importing & Mfg. Co., 49 cs. from Hamburg; Harder & Boesenberg, 8 cs. from Hamburg; Bernard, Judae & Co., 5 cs. from Hamburg; Meadows, Wye & Co., 4 cs. from Hamburg; U. S. Forwarding Co., 36 cs. from Hamburg; H. Reeve Angell & Co., 26 bls. from Hamburg; Hermes Bros., 12 cs. from Hamburg; Eastern Calender Co., 5 cs. from Hamburg; Prager Co., 47 cs. from Hamburg; Lindt Chocolate Co., 4 cs. from Rotterdam.

Miscellaneous

L. A. Consmiller, 27 cs. from Rotterdam; Kern Commercial Co., 9 cs. from Rotterdam; H. W. Robinson & Co., 3 cs. from Hamburg; Hensel, Bruckmann & Lorbacher, 9 cs. from Hamburg; Bendix Paper Co., 2 cs. from Hamburg; A. Ringk & Co., 4 cs. from Hamburg; H. Kayser & Fils, 69 cs. from Havre; Globe Shipping Co., 10 cs. from Rotterdam; R. L. Fuller & Co., 5 cs. from Havana; Ford of France, 4,233 cs. paper bags from Havre; National Paper & Type Co., 12 cs. from Santos; E. C. Melby, 43 bls. from Gothenburg; P. H. Petry & Co., 5 cs. from Hamburg; B. E. DeSola, 5 cs. from Hamburg; Kestenbaum Bros., 2 cs. from Southampton; G. Gennert, 22 cs. from London; Japan Paper Co., 42 cs. from Yokohama; M. L. Adams, 5 cs. from Yokohama; Baldwin Shipping Co., 10 cs. from Hamburg; H. W. Walden, 40 cs. from Marseilles; P. Puttmann, 10 cs. from Antwerp; Guaranty Trust Co., 48 cs. from Antwerp; J. J. Gavin & Co., 2 cs. from Liverpool; Bernard, Judae & Co., 2 cs. from Bremerhaven; H. D. Catty & Co., 4 cs. from Havre; American Express Co., 293 cs. from Havre; P. Meyer, 4 cs. from Havre; T. D. Downing & Co., 8 cs. from Hamburg; D. S. Walton & Co., 2,171 pkgs. from Hamburg; Passaic Paper Tube Mfg. Co., 38 bls. from Hamburg; Order, 10 cs. from Hamburg, 10 cs. from London and 35 cs. from Hong Kong.

Foreign Trade Opportunities

A commercial agent in Brazil desires to secure the representation of manufacturers of paper and paper products. Reference. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 35111.

A report from an American consul in Canada states that a new pulp and paper mill is to be erected and firms should submit proposals for furnishing machinery and supplies. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, Washington, D. C., referring to Inquiry No. 35121.

A trading company in India desires to secure an agency for the sale of heavy chemicals, colors, aniline dyes, sizing materials, paper and old newspapers. References. For further data those interested should communicate with the Bureau of Foreign and Domestic Commerce, referring to Inquiry No. 35028.

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"The Wrapper that Delivers the Goods"

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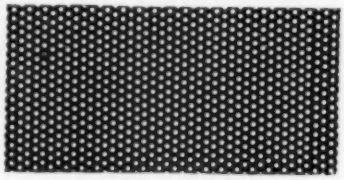
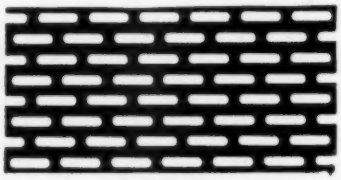
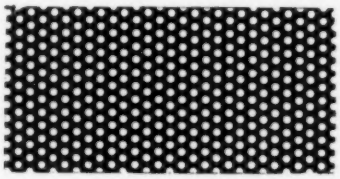


.065 inch round



⅛ x ½" Slots



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ALSO ONE BRAND NEW 112" BOARD MACHINE.

Seven 36" x 112" cylinders; Ninety 48" x 108" dryers; six 16" primary presses—rubber and gunmetal; four 20" main presses—rubber and gunmetal; two 5" roll calender stacks (largest roll 22" diameter, smallest roll 14" diameter); one stack with two upright reels; one single shaft winder; one complete Marshall driving train; seven 8 plate packer screens; Felt carrier rolls all brass covered. Dryer gears are cut. Immediate delivery. Duplicate can be seen in operation. Will sell for cash at very low figure.

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